Vol. 923 Number 5

OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

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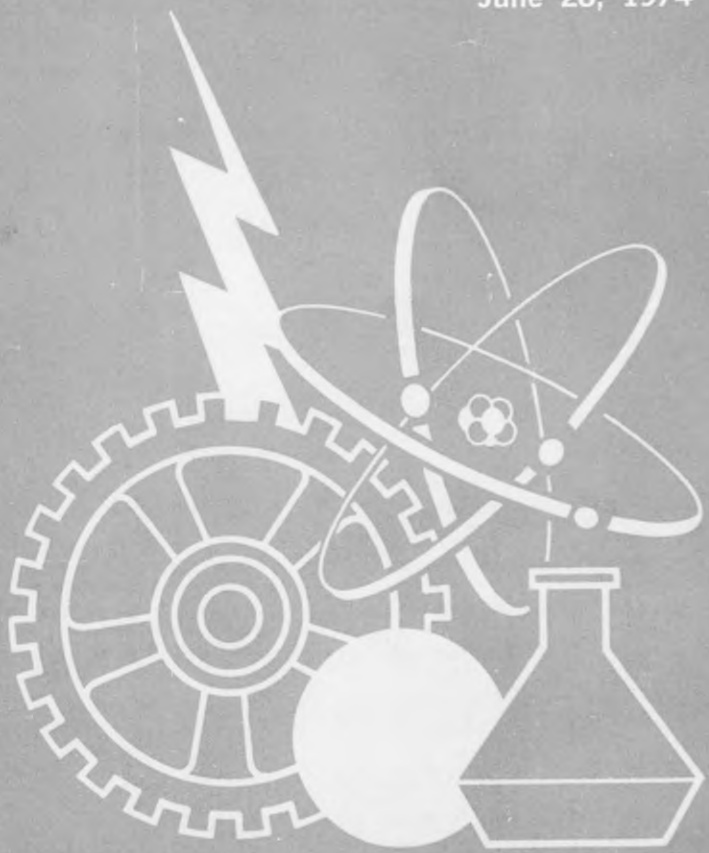
PATENTS

June 28, 1974



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE
June 28, 1974 Volume 923 Number 5

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PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 8, 1974

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds: Inorganic Compositions: Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-2-73
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids, Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	3-26-73
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-3-73
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	6-15-73
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-6-73
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-1-73
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-19-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-9-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	2-14-73
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-9-73
DESIGNS, GROUP 290—C D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	9-29-72
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	9-14-73
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	7-10-73
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	5-21-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-7-73
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures: Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating: Textiles; Apparel and Shoes; Sewing Machines.	6-13-73

Expiration of patents: The patents within the range of numbers indicated below expire during June 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253 Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

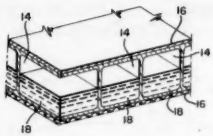
Patents..... Numbers 2,794,186 to 2,797,413, inclusive
Plant Patents..... Numbers 1,606 to 1,611, inclusive

PATENTS

GRANTED JUNE 28, 1974

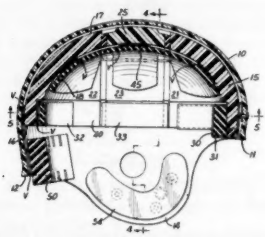
GENERAL AND MECHANICAL

3,820,162
CONSTANT PRESSURE MATERIAL
Stephen Paul McGrew, 4624 W. 34th St., Spokane, Wash. 99204
Filed Jan. 5, 1971, Ser. No. 104,056
Int. Cl. A62b *17/00*
U.S. Cl. 2—2.1 A **10 Claims**



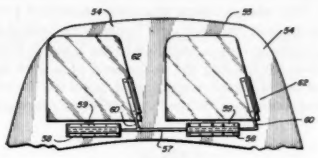
A flexible cellular material is disclosed which has a substance or substances sealed therein capable of maintaining a substantially constant inflation pressure therein regardless of changes in volume, external pressure, or deformation of the cellular material. The material incorporated and sealed in the cellular material is a liquid or solid material which responds to external pressure variations by transformation to the gaseous state until the volume in the cellular material occupied by the gaseous vapors of the material is substantially equal to the equilibrium vapor pressure at a given temperature. The cellular material is preferably multi-cellular and is useful in pressure suits, pressure bandages, mattresses, cushions, packaging and other applications where a constant, uniform pressure against an object or objects is desired.

3,820,163
FOOTBALL HELMET HAVING SECTIONAL LINER OF ENERGY ABSORBING MATERIAL
Frederick A. Rappleyea, Schiller Park, Ill., assignor to Cougar, Inc., Schiller Park, Ill.
Filed May 7, 1973, Ser. No. 358,001
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 R **6 Claims**



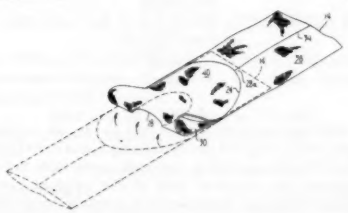
A protective helmet having an outer durable shell and an inner replaceable liner of expanded, closed cell, plastic material of a type which is capable of absorbing energy by taking a permanent set. The liner, which is of generally hemispherical shape to conform to the inner wall of the shell, is formed of separate spaced but adjoining sections, the sections being separated from one another by strips of foam rubber. Preferably the liner is made up of front and back sections, side sections and a top section in interfitting relation with the separator strips being secured to one of the adjoining sections so that the strips need not be separately handled. The liner is fitted about its inner periphery with replacable sizer pads of foam rubber or the like. The liner sections are secured to the shell and the sizer pads are secured to the liner sections by cooperating strips of hook-and-loop tape so that both the sections and sizer pads may be individually replaced.

3,820,164
NIGHT DRIVING GLARE SHIELDS
Jan Kiebala, 5189 N. Canfield, Norridge, Ill. 60656
Filed July 5, 1973, Ser. No. 376,534
Int. Cl. A61f *9/00*
U.S. Cl. 2—10 **7 Claims**



An antiglare assembly for night driving wherein outwardly swingable translucent shields are provided for each eye. The shields are pivotally mounted to a head supported member such as eyeglasses, each of said shields being elongated to provide a greater antiglare field against oncoming traffic which follows a rolling road, where the headlights of the oncoming car are in advance of the car below a hill. Effective shielding against glare is attained by stopping the outward swing of each shield to about 90° from its initial position in which the planes of the shields are normal to the direction of vision. The right shield is stopped in its outward swing to an adjacent nose side position, and the left shield is swung outwardly to an adjacent ear side position to thereby screen against glaring lights.

3,820,165
DOUBLE SKIRT SHEATH DRESS
Ann C. Negherbon, 2431 Leslie Ave., Martinez, Calif. 94553
Filed June 26, 1972, Ser. No. 266,007
Int. Cl. A41d *1/22*
U.S. Cl. 2—74 **1 Claim**



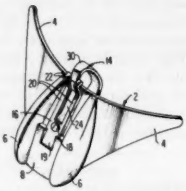
A sheath dress fabricated from a single piece of fabric. The skirt portion is formed of two layers of fabric, either one of which can define the exterior of the dress. A method for cutting out and fabricating the dress.

3,820,166

DEVICE FOR SUPPORTING AND FORMING A NECKTIE KNOT

Aubrey L. Gouner, Metairie, La., assignor to Wembley Industries Inc., New Orleans, La.

Filed July 3, 1972, Ser. No. 268,426
Int. Cl. A41d 25/08
U.S. Cl. 2—153 7 Claims



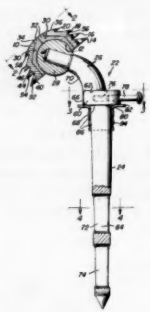
A necktie is formed over and supported by an integrally-formed piece of plastic with a pair of spaced apart vertically elongated rounded forward projections which provide a recess therebetween to receive permanently pre-dimpled portions of a necktie. The integral piece also has a rearward projection which adds bulk to the knot, and laterally extending thin flat wings. A clamping means attached to the integral body has a pressure foot for holding the collarband of a shirt against a rear face of the rearward projection to orient the device so the forward projections are inclined upwardly and rearwardly.

3,820,167

ARTIFICIAL HIP JOINT

Konstantin Mitrofanovich Sivash, ulitsa Bolshaga Pirogovskaga 37/43-A, kv. 49, Moscow, U.S.S.R.

Continuation-in-part of Ser. No. 737,910, June 18, 1968, abandoned. This application Oct. 14, 1971, Ser. No. 189,261
Int. Cl. A61f 1/24
U.S. Cl. 3—1 47 Claims



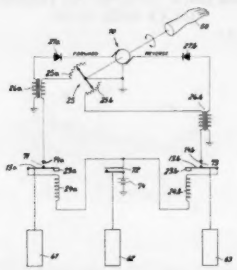
An artificial hip joint is provided having an acetabulum prosthesis of the cotyloid cavity defining a socket and having a plurality of blades extending outwardly away from the socket for engaging the prepared wall of the cotyloid cavity. A prosthesis of the head of the femur is movably interconnected with the acetabulum prosthesis and includes a pin to be driven into the bone-marrow channel of the femur, a curved neck integral with the pin, and a hip ball fixedly positioned on the neck and movably located within the socket, the socket enveloping more than one-half of the hip ball to prevent withdrawal of the hip ball from the socket.

3,820,168

SYSTEM FOR OPERATING A PROSTHETIC LIMB

Eduard Horvath, Duderstadt, Germany, assignor to Firma Otto Bock Orthopadische Industrie KG, Duderstadt, Germany

Continuation-in-part of Ser. No. 33,694, May 1, 1970, abandoned. This application Sept. 11, 1972, Ser. No. 288,093
Claims priority, application Germany, Oct. 16, 1971, 2151563
Int. Cl. A61f 1/00, 1/06
U.S. Cl. 3—1.1 8 Claims



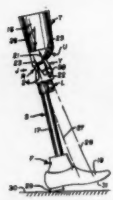
A servomotor for moving a prosthetic limb is actuated by a controller which responds to local variations in muscular rigidity as determined by one or more pressure sensors bearing upon the flesh of the wearer within an annular frame contacting an area of his body. The frame may be resiliently supported in a cutout of a rigid sleeve by one or more springs urging it into contact with an underlying stump. The contacts of the sensor form part of an electromagnetic vibrator whose oscillations, felt by the user, are modulated by a feedback signal controlled by the position or the speed of the prosthetic limb.

3,820,169

LOWER LIMB PROSTHESIS

Ivan A. Long, and Richard L. Long, both of 1478 Birch St., Denver, Colo. 80220

Continuation-in-part of Ser. No. 71,745, Sept. 14, 1970, abandoned. This application June 2, 1972, Ser. No. 258,949
Int. Cl. A61f 1/04, 1/08
U.S. Cl. 3—22 10 Claims



The lower limb prosthesis includes a knee joint connecting a thigh section to a shin section, to which a foot is attached, the knee joint including a rear link and a yoke-shaped front link pivotally connected between upper and lower bodies, and the rear link pivot points being so positioned that, with the lower limb in extended position, an extension of the centerline of the rear link pivot points will intersect the foot forwardly of the heel, while extensions of the centerlines of the rear link and front link will intersect above and rearwardly of the knee, to provide stability. A wedge-shaped abutment, engageable with

the rear link, limits pivotal movement of the joint and is adjustable to change the point of release, i.e. the point at which the knee joint will begin to flex, when the body moves forwardly over the foot, during walking. An elastic strap interconnecting the forward and rear links resists extension after flexing and prevents terminal impact. A shin tube extends between clamps on the lower body of the knee joint and the foot, so that tubes of different lengths can be used to provide different lengths of the lower limb.

3,820,170

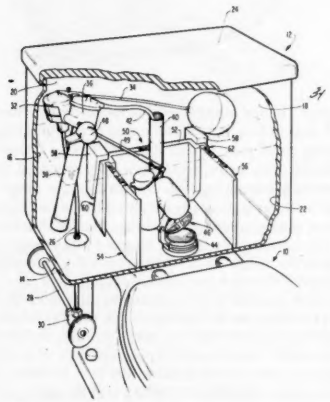
WATER CONSERVING METHODS AND APPARATUS FOR FLUSH TOILETS

Hall S. Kern, Falls Church, and Murphy L. Barnes, Jr., Alexandria, both of Va., assignors to Environmental Design, Inc., Falls Church, Va.

Filed Apr. 10, 1973, Ser. No. 349,746

Int. Cl. E03d *1/14, 1/22*

U.S. Cl. 4—18 **17 Claims**



A barrier for retaining fresh water within a flush toilet tank comprises an end retainer wall, a pair of side retainer walls attachable to the end retainer wall, and a pair of wedges insertable between the end retainer wall and an upstanding tank wall to press the barrier into sealing engagement with the tank interior. The wedges engage sloping pressure faces of the end retainer wall which distribute the pressing forces of the wedge into horizontal and vertically downward components. The side retainer walls are freely interengageable with the end retainer wall, such that the retainer walls may be assembled together within the tank. The tank-contacting edges of the retainer walls are defined by integral, beveled peripheral portions of the retainer walls.

3,820,171

FLUID CONTROL MECHANISM

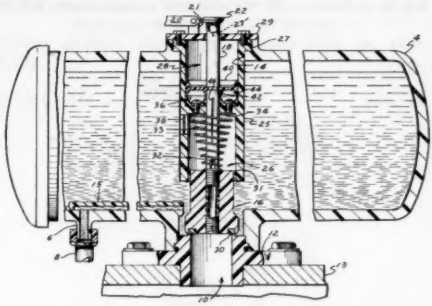
Wesley S. Larson, Enfield, Conn., assignor to Water Control Products, Inc., New York, N.Y.

Filed Aug. 17, 1972, Ser. No. 281,412

Int. Cl. E03d *3/00, 3/04, 3/06*

U.S. Cl. 4—31 **5 Claims**

Hydraulic discharge systems having a pressurizable water tank with an inlet for supplying water under pressure to the tank and a water discharge port with a piston valve to control the opening and closing of the port and a spring urging said valve to its closed position. A vented chamber and dashpot chamber are disposed within said tank with the piston valve operating in the vented chamber. A rod extends from said piston through said chambers and a dashpot piston is axially affixed thereto and is reciprocably movable in the dashpot



chamber. An air bleed conduit interconnects the dashpot and vented chambers to control the rate of closing of the piston valve under the influence of said spring.

3,820,172

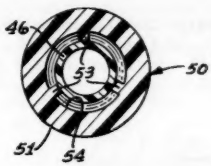
SWIMMING POOL CLEANING APPARATUS

Robert J. Kane, 5035 N. 12th St., Phoenix, Ariz. 85011

Filed Oct. 2, 1972, Ser. No. 294,095

Int. Cl. E04h *3/16, 3/18*

U.S. Cl. 4—172.15 **3 Claims**



Flexible sweep hoses for use in swimming pools for cleaning purposes which are provided with specially constructed high velocity, multi-jet cleaning nozzles at their outer ends and a plurality of long-lasting, adjustably positioned wear rings surrounding the flexible hoses in strategic locations to prevent excessive hose wear. The hoses are demountably connected to quick disconnect plug outlets in the pool walls or associated cleaning apparatus for the pool.

3,820,173

CIRCULATOR FOR CIRCULATING WATER IN RECEPTACLES

Elmar Weller, Schwabisch Gmund, Germany, assignor to Uwe-Unterwasser-Electric GmbH & Co. KG, Schwabisch Gmund, Germany

Filed June 20, 1973, Ser. No. 371,885

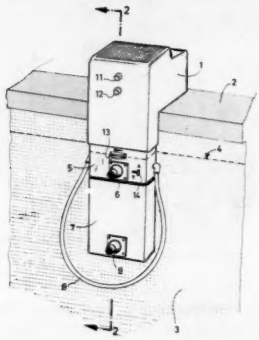
Claims priority, application Germany, Mar. 17, 1973, 2313326

Int. Cl. E04h *3/16, 3/18*

U.S. Cl. 4—172.17 **10 Claims**

A housing has an upper first portion adapted to be located above, and a lower second portion adapted to be, at least in part, located below the level of water in a receptacle. The second portion has an inlet and an outlet. A pump and a drive for the same are mounted in the first portion and the pump has an intake port and a discharge port. A discharge conduit is provided in the housing and communicates with the discharge

port and with the outlet. A reservoir is provided in the first portion and communicates with the intake port on a first level which is lower than that of the discharge port. An intake conduit is connected with the inlet and communicates with the



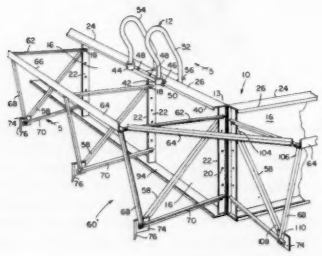
reservoir on a higher second level so that there will always be a quantity of water retained in the reservoir intermediate the levels, irrespective of the operating condition of the circulator, so that the pump is self-priming.

3,820,174

SWIMMING POOL CONSTRUCTION

Henry A. Rozanski, Box 127, R.D. No. 2, Elizabethtown, Pa. 17022

Filed Oct. 25, 1972, Ser. No. 300,658
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.19 **7 Claims**



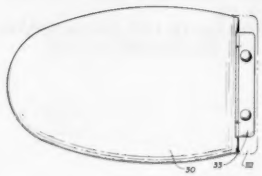
A swimming pool construction has an outer shell defined by a plurality of metal sections which are secured to each other and have substantially vertical walls defining the swimming area of the pool. Each metal section includes a coping support extending outwardly of the swimming area in a horizontal direction from the upper end of each vertical wall, and a coping is secured to the coping support about the outer periphery of the swimming area. Transversely spaced sockets for receiving one end of transversely spaced handrails of a swimming pool ladder are secured to the outer end of the coping support prior to the formation of a concrete deck or walk around the outer periphery of the swimming pool. Structural supports are secured to the outer shell of the swimming pool to provide support for the concrete deck or wall. The structural supports extend outwardly of the metal sections of the pool and support horizontally disposed, top angle members which are disposed outwardly of the coping. The coping has a substantially horizontal upper surface which is in horizontal alignment with the top of the top angle members. A concrete form for the deck or walk is defined between the coping, the top of the angle members and the backfill. The upper horizontal surface of the coping and the top of the top angle members form horizontal, spaced guides for deck screeding purposes.

3,820,175

QUICK CHANGE HINGE ASSEMBLY

Vernon L. Waldon, Crawfordsville, Ind., assignor to Ingress Manufacturing Co., Inc., Crawfordsville, Ind.

Continuation-in-part of Ser. No. 123,741, March 12, 1971.
This application Feb. 23, 1972, Ser. No. 228,562
Int. Cl. A47k *13/12*
U.S. Cl. 4—236 **12 Claims**



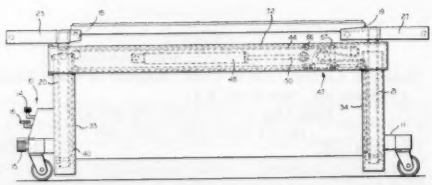
A quick change hinge assembly for pivotally coupling members. A pair of hinge blocks mounted to a fixture have laterally extending pivot pins. A first member having laterally extending sockets with entry slots is pivotally mounted to a pair of the inwardly extending pins mounted to the hinge blocks. A second member is pivotally mounted to the outwardly extending pivot pins mounted to the hinge blocks. Another embodiment has horizontally spaced hinged blocks mounted to a fixture with the hinge blocks having laterally extending sockets. A first member has outwardly extending pivot pins received in the sockets whereas a second member has inwardly extending pivot pins received in the sockets. A third embodiment has a pair of hinge blocks with laterally extending sockets and entry slots pivotally receiving pivot pins mounted to a first member. Additional pins are mounted to the first member and extend outwardly into laterally extending sockets and entry slots of a second member. In the preferred embodiment, the first and second members are pivotally mounted to a single pin which is removably mounted to a pair of spaced apart and unconnected hinge blocks. The pin has crescent shaped portions received by laterally extending sockets and channels of the members.

3,820,176

PATIENT HANDLING TABLE

Orrin G. Feiertag, Milwaukee, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 15, 1972, Ser. No. 306,827
Int. Cl. A61g *7/10*
U.S. Cl. 5—63 **14 Claims**



A table top is supported in cantilever fashion from two spaced apart vertically movable posts which are guided in upright columns. A cross guide extends between the columns

and it supports a carriage for bidirectional longitudinal movements. Opposite ends of a chain engage the posts and the chain runs over guide sprockets one of which is carried by the carriage. The carriage sprocket is selectively lockable and releaseable so that when the carriage is translated by suitable power means the table elevates. Release of the carriage sprocket permits the table to be inclined longitudinally in either direction by pressing or lifting on either end thereof.

3,820,177

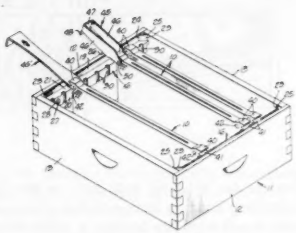
HONEYCOMB SPACER STRIP

Kenneth F. Croan, 2165 N. Grand Oaks, Altadena, Calif. 91001

Division of Ser. No. 107,950, Jan. 20, 1971, Pat. No. 3,758,896. This application Feb. 26, 1973, Ser. No. 335,781

Int. Cl. A01k *47/02*

U.S. Cl. 6—2 A **8 Claims**



A self-gripping spacer strip readily installed crosswise of the ends of a beehive super and provided with seating notches for use in holding artificial honeycombs properly spaced from one another in a super. Each strip includes a resilient tang at its ends having an interference fit with the adjacent sidewall of the super. The strip also includes a support ledge for the honeycombs and so designed as to rest against the conventional rabbet along the inner edges of the super endwalls.

3,820,178

SWIMMING AIDS

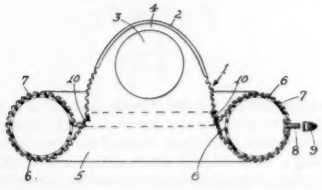
Mona Lilian Bentley, 37 Club St., Linksfield, Johannesburg, South Africa

Filed Aug. 11, 1971, Ser. No. 170,740

Claims priority, application South Africa, Aug. 31, 1970, 70/5961

Int. Cl. B63c *9/16*

U.S. Cl. 9—337 **1 Claim**



A swimming aid for children comprising a vest-like harness which includes arm holes and a short body-embracing portion and which is arranged to be put on and removed over the head; an annular retaining sheath fast with the body-embracing portion; and an inflatable tube trapped in the sheath in breast embracing position.

3,820,179

FLOTATION SLEEVES

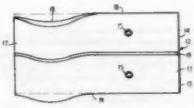
Klaus Paul Maertin, No. 10 Weeroona Ave., Elanora Heights, N.S.W., Australia

Filed May 19, 1972, Ser. No. 255,041

Claims priority, application Australia May 24, 1971, 4963/71

Int. Cl. B63c *9/12*

U.S. Cl. 9—344 **4 Claims**



An inflatable flotation sleeve adapted to be worn on the upper arm of the user. It includes at least one continuous generally tubular closed structure formed in a fluid impervious flexible resilient material and fluid valve means providing access to the structure for inflation thereof. The structure is adapted to surround the user's upper arm and includes a substantial portion adapted to be located on the arm adjacent the body, this portion being shaped so as to substantially reduce any bodily encumbrance thereby.

3,820,180

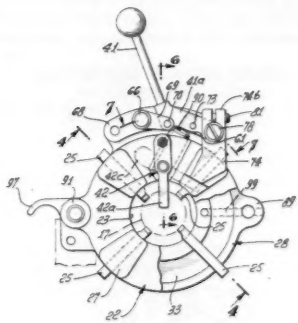
AUTOMATIC LEVER CONTROLLED DIE HEAD

Orville J. Birkestrand, Monterey Park, and John L. Haas, Rowland Heights, both of Calif., assignors to Collins Machinery Corporation, Monterey Park, Calif.

Filed Apr. 9, 1973, Ser. No. 349,324

Int. Cl. B23g *1/52, 5/12*

U.S. Cl. 10—94 **3 Claims**

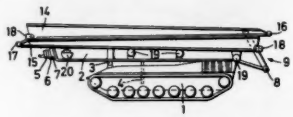


A work threading tool includes a lever movable between an operating position in which thread chasers are advanced to work threading position and release position in which the chasers are in retracted position; and trip mechanism operatively connected with the lever to respond to predetermined relative endwise travel of the threaded work to effect automatic displacement of the lever from operating to release position and consequent retraction of the chasers.

3,820,181
BRIDGE LAYING DEVICE

Gerhard Wagner, Mainz-Lerchenberg, and Walter Kinzel, Mainz, both of Germany, assignors to Klockner-Humboldt Deutz Aktiengesellschaft, Koln-Deurz, Germany

Filed Mar. 29, 1972, Ser. No. 239,252
Claims priority, application Germany, Apr. 2, 1971, 2116120
Int. Cl. E01d 1/00
U.S. Cl. 14—1 10 Claims

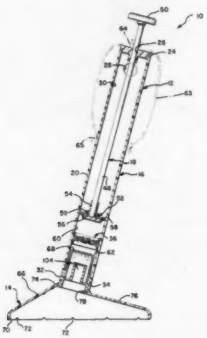


A bridge laying device in which a vehicle carries a tiltable and extensible beam, and carried on the beam are at least two bridge sections adapted to be coupled in end to end relation to form a bridge. The device includes an arrangement for moving one bridge section out along the beam when the latter is extended and at the end of the beam nearest the vehicle is a mechanism for manipulating the other bridge section to effect coupling of the bridge sections together while still resting on the extended beam. Thereafter, the end of the bridge formed by the coupled together sections is engaged with a stationary support on one side of the space to be bridged and the beam is then retracted and the other end of the bridge formed by the coupled together sections is deposited on a stationary support at the adjacent side of the space being bridged. The bridge sections are of the same dimensions and substantially identical and the bridge can be returned to the vehicle from either end of the bridge.

3,820,182
SWIMMING POOL CLEANER

William J. Vockroth, 1148 Pleasant Dr., Harrisburg, Pa. 17111

Filed Dec. 26, 1972, Ser. No. 318,192
Int. Cl. E04h 3/20; A47l 5/02
U.S. Cl. 15—1.7 2 Claims

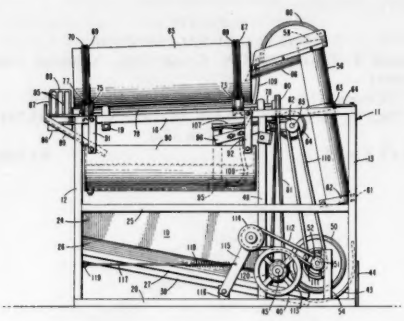


The invention disclosed herein relates to a cleaning device for swimming pools and more particularly to a hand-operated cleaner having a reciprocating piston assembly which draws debris-laden water from the floor of the pool into a barrel assembly and sequentially through a liner which catches and retains macroscopic particles such as pebbles, leaves, paper and the like and through a strainer which catches and retains microscopic particles.

3,820,183
BALL WASHER

August W. Gustafson, and Edna L. Gustafson, both of 350 Pasadena Pl., Corpus Christi, Tex. 78411

Filed Apr. 19, 1973, Ser. No. 352,625
Int. Cl. A63b 47/04
U.S. Cl. 15—21 A 8 Claims

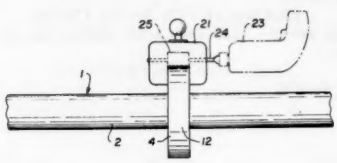


An apparatus for washing golf balls or the like has an elevated scrubbing drum, a hopper below the drum, a chute for golf balls to roll from the hopper, a wheel over the chute for propelling golf balls upwardly towards the drum, a pipe for intercepting the balls while in flight and means for diverting the golf balls into the drum.

3,820,184
PIPE CLEANING DEVICE

John F. Stone, Elizabethtown, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 31, 1973, Ser. No. 365,756
Int. Cl. B08b 9/00
U.S. Cl. 15—104.04 2 Claims



A cleaning device for the outside surface of a pipe comprises a pair of semi-annular members each having a pair of opposite free ends 180° apart, each of the semi-annular members having a semi-circular inner surface and a semi-circular outer surface. A hinge device at a corresponding free end of each of the members hingedly joins the members to each other. A releasable fastener at the other corresponding free end of each of the members releasably affixes the members to each other in substantially O-shaped configuration. A plurality of wire brush bristles are affixed to the inner surface of each of the members and extend substantially radially inward. A housing encloses part of the semi-annular members. A driving device in the housing is coupled to the semi-annular members for rotating the members about their common axis.

3,820,185

BARBECUE GRILL CLEANING DEVICE

Carroll D. Phillips, 134 Cherry Brook Rd., Weston, Mass. 02193

Filed Jan. 4, 1973, Ser. No. 321,073
Int. Cl. A47j 37/07; A47l 17/00
U.S. Cl. 15—105 7 Claims

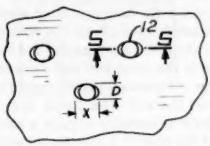
A device for cleaning barbecue grills comprising a blade having a slot therein adapted to engage the grill rods. The blade is preferably twisted to facilitate pivoting the slot about the grill rods to clean the under surfaces thereof, and the blade may have two slots, one on open slot at the tip thereof and one a closed slot set back from the tip, to enable cleaning of different sized grill rods. If the blade has two slots therein, the tip of the blade must be bent over just behind the scraping surface of the closed slot to permit engagement of the closed slot with the grill rods. In this case the closed slot is also preferably formed with an enlargement immediately behind the bend at the front of the slot, and the blade is preferably bent back near the opposite end of the closed slot.

3,820,186

ELONGATED HOLE BRUSH

Ralph C. Peabody, Minneapolis, Minn., assignor to Tennant Company, Minneapolis, Minn.

Filed Mar. 29, 1972, Ser. No. 239,257
Int. Cl. A46b 3/16; A46d 1/08
U.S. Cl. 15—182 7 Claims



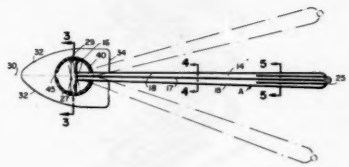
A rotary tubular brush having a tubular core, said core having axially elongated tuft holes, and tufts secured in the holes by staples. The tuft holes may be formed by, for example, a machine that moves a rotary drill for drilling circular holes first downwardly and then upwardly while the core is moved axially. Also the tuft holes may be formed by burning, casting or punching. Additionally, brushes other than tubular brushes may have tuft holes for tufts that are of a greater cross-sectional dimension in one direction than the other in a plane perpendicular to the depth direction of the holes.

3,820,187

TOILET BRUSH WITH IMPROVED UNIVERSAL JOINT

J. L. Numbers, Scottsdale, and Guy Bailey, Phoenix, both of Ariz., assignors to Guy Bailey, Phoenix, Ariz.

Filed Aug. 30, 1972, Ser. No. 284,857
Int. Cl. A47l 13/257; B25g 3/38
U.S. Cl. 15—244 A 9 Claims



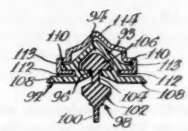
A toilet brush which can be removably mounted to and from an elongate handle at an improved universal joint. The elongate handle includes a pawl mounted normally to the length of the elongate handle. A hand-sized parabolic plate made of semi-rigid plastic includes a sponge brush at the bottom surface and a mounted circular track on the upper surface. The circular track, also made of semi-rigid plastic, deforms to receive the two opposed ends of the pawl. By the expedient of rotating the pawl within the circular track or rotating the handle about the axis defined longitudinally of the pawl, universal-type movement of the handle with respect to the brush is disclosed. The handle is provided with improved rigidity by a series of vertical flanges extending along its length.

3,820,188

WINDSHIELD WIPER BLADE STRUCTURE

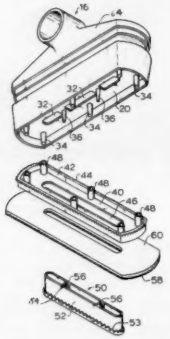
John P. Moorhead, Palos Verdes, Calif., and Donald W. Stratton, Hammond, Ind., assignors to The Anderson Company, Gary, Ind.

Filed Feb. 1, 1973, Ser. No. 328,649
Int. Cl. B60s 1/04, 1/38
U.S. Cl. 15—250.42 17 Claims



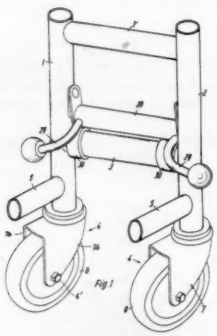
A windshield wiper assembly for a curved windshield, including a pressure distributing superstructure having claws adapted to engage a blade structure at longitudinally spaced positions, together with a blade structure including a flexible holder having a pair of laterally opening slots for receiving the claws of the superstructure, and a longitudinal retention chamber receiving an enlarged retention bead along the upper edge of a resilient wiping element.

3,820,189
BRUSH ADAPTOR FOR VACUUMING
Eric Michael Roth, R.R. No. 1, Unionville, Ontario, Canada
Filed Dec. 11, 1972, Ser. No. 314,119
Int. Cl. A47l *9/06*
U.S. Cl. 15—400 2 Claims



A slant pile brush surrounds an aperture to a chamber which is connectible to a vacuum source.

3,820,190
STEERABLE ASSEMBLY FOR WHEELCHAIRS AND THE LIKE
Friedhelm Moller, Tonisheide, Germany, assignor to Firma Happe & Co., Tonisheide, Wulfrather Str., Germany
Filed May 22, 1972, Ser. No. 255,448
Claims priority, application Germany, May 21, 1971, 2125214
Int. Cl. B60b *33/00*
U.S. Cl. 16—35 14 Claims

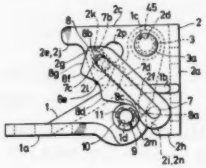


A steerable assembly for wheelchairs, movable beds and like devices adapted to be moved across the ground or floor on rollers. The assembly has a pair of upright transversely interconnected tubular posts at the bottom of which are provided caster rollers in respective bifurcated caster supports or forks. Within the latter, bifurcated springs can be deflected in opposite directions to engage the post and the roller periphery to immobilize the support and the roller when an actuating member is swung from one position to another. The actuating member forms a toggle with a crossbar member as it is displaced through a dead-center position and has a pair of pins at its ends which engage, through slots in the posts, respective slides controlling the shafts which operate the bifurcated springs.

3,820,191
CURTAIN SUSPENDING DEVICE
Alphonse Gay, 36, Ave. Weber, 1200 Geneva, Switzerland
Filed Oct. 12, 1972, Ser. No. 296,765
Claims priority, application Switzerland, Oct. 15, 1971, 15066/71; Aug. 1, 1972, 11387/72
Int. Cl. E05d *15/58*
U.S. Cl. 16—87.2 2 Claims

A curtain runner includes a hemispherical body having a curtain hooking member protruding from a vertex of the dome thereof. The curtain hooking member may be partially embedded in the body member, or removably clipped through an axial bore.

3,820,192
DOOR HINGE UNIT
Ryuzo Nakano, Oaza; Shinichiro Yamazaki, Toyota, and Shinzi Ogasawara, Hekinan, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Aichi Pref., Japan
Filed Aug. 21, 1973, Ser. No. 390,274
Claims priority, application Japan, Aug. 21, 1972, 47-97841
Int. Cl. E05d *11/10*
U.S. Cl. 16—145 1 Claim

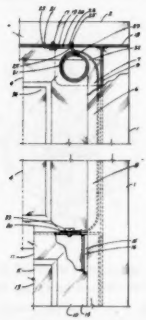


A door hinge unit is provided with a fixed leaf and a movable leaf joined by a hinge pin for pivotal movement relative to each other. A torsion bar having a main straight part and opposed U-shaped bends at each end is rotatably mounted on one of the leaves along the main part of the bar. One U-shaped bend is anchored in the same leaf and a check arm having two separate openings is mounted on the opposite end of the bar and the main part thereof. The check arm is provided with cam portions which selectively engage a roller detent on the other leaf to hold the door in a plurality of positions.

3,820,193
SPRING SASH COUNTERBALANCE
Edwin E. Foster, 1801 Camp Craft Rd., Austin, Tex. 78767
Filed Aug. 24, 1972, Ser. No. 283,400
Int. Cl. E05d *13/12*
U.S. Cl. 16—197 6 Claims

A counterbalance for a window sash being of self-coiling spring type and adapted for alternative disposition wherein the free end of the spring ribbon may be secured to the sash and the coil disposed adjacent the window frame header; or with the free end of the spring ribbon secured to the header and the

coil carried upon the window sash. A spring support is provided for either condition of use with the same having guide means for retaining the coil against displacement and an open-



ing for threading of the extended portion of the ribbon therethrough; the coil being without a supporting spool or related to load-receiving surfaces.

3,820,194

CUTTING DEVICE FOR LARGE PIECES OF SOFT FOODSTUFFS

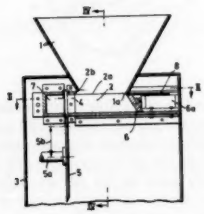
Josef Jakob Thiesen, Kyffhauserstrasse 35/37, D-5 Cologne, Germany

Filed Nov. 13, 1972, Ser. No. 305,953

Claims priority, application Germany, Nov. 15, 1971, 2156631

Int. Cl. A22c *7/00*

U.S. Cl. 17—32 **11 Claims**



The outlet of a feed hopper communicates with a chamber located beneath it. Along one side of the chamber extends a channel having an open outlet end and being open to the chamber. From the other side a plunger is movable towards the channel so as to push food which has entered through the outlet, transversely of the chamber and into the channel. A cutter blade is movable along the open side of the channel so as to sever the food in the channel from the food in the chamber, and a pusher element can move in the channel longitudinally thereof for pushing the severed food out of the open end of the channel.

3,820,195

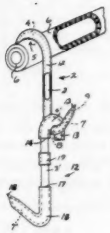
MEAT-HANGING APPARATUS AND THE LIKE

Robert D. Hutzell, 1430 S.W. 345th Ave., Hillsboro, Oreg. 97123

Filed Dec. 13, 1972, Ser. No. 314,818

Int. Cl. A22b *1/00*

U.S. Cl. 17—44.2 **3 Claims**



Presented is a meat hook and meat-hanging apparatus which are either covered with a layer of tough resilient nonmetallic material, or which are fabricated entirely from such tough resilient nonmetallic material.

3,820,196

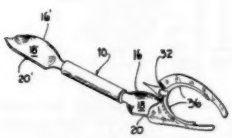
FISH CLEANING DEVICE AND METHOD FOR FILLETING

Melvin C. Penman, 560 Heim Rd., Getzville, N.Y. 14068

Division of Ser. No. 50,848, June 29, 1970, Pat. No. 3,672,002. This application June 19, 1972, Ser. No. 263,763

Int. Cl. A22c *25/16*

U.S. Cl. 17—46 **2 Claims**



A hand tool having a handle with a concave blade at each end and a method for obtaining a skinless, boneless one piece fillet. The blade includes a linear shearing edge boneless a curvilinear shearing edge conforming to the rib cage of a fish, the edges converging to an apex. The apex of the blade may be inserted in a slit along the backbone of the fish terminating in a transverse slit at the tail. With the concavity facing toward the tail, the linear shearing edge bearing against the inner surface of the skin and the curvilinear shearing edge embracing the rib cage, the tool is moved from the head toward the tail to remove substantially all of the flesh portion of the fish with a plow-like action. The blades are mirror images of each other, one being suitable for use on one side of the fish and the other blade suitable for use on the opposite side of the fish.

3,820,197

MACHINE FOR OPENING COTTON BALES

Walter Jeanmaire, Fabrikstr. 17, 809 Kollnau, Germany

Filed Nov. 21, 1967, Ser. No. 684,833

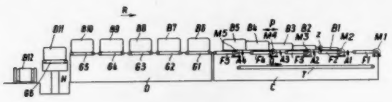
Claims priority, application Germany, Nov. 21, 1967, 32579

Int. Cl. D01g *7/04*

U.S. Cl. 19—80 **1 Claim**

Apparatus for opening a plurality of bales including an aligned first series of conveyor belts adapted to reciprocate in the aligned direction in such timed sequence that the last belt

in the direction of movement is the first belt to move in that direction; opening means disposed between a plurality of said belts adapted to pick material from the bottoms of bales disposed on said belts during reciprocation; and control means operatively associated with the downstream most conveyor



belt and bale carried thereby which control means, upon completion of the opening of the downstream most bale, is adapted to cause the remaining bales to move downstream by one conveyor belt length and adapted to cause an additional bale to be positioned on the upstream most conveyor belt.

3,820,198

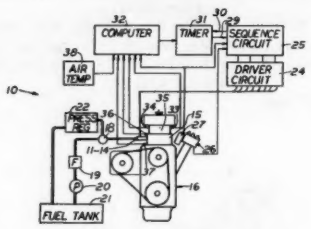
SWITCHING CIRCUITRY FOR SEQUENTIAL FUEL INJECTION

Bruce A. Scofield, Fort Wayne, Ind., assignor to International Harvester Company, Chicago, Ill.

Filed June 21, 1972, Ser. No. 265,047

Int. Cl. F02m *51/06*

U.S. Cl. 123—32 EA **17 Claims**



Switching circuitry for sequential fuel injection in which transistor driver stages for injector valve actuators are coupled to AND gate means having inputs to which timing signals are applied from flip-flop means and having additional inputs to which control signals are applied from a sequencing circuit, preferably comprising a digital counter and decoder gates for developing the control signals. The control signals have a duration sufficient to allow the timing signals to effect opening of the injector valves for nearly 180 degrees of crankshaft rotation, in timed relation to the intake strokes. In one embodiment, designed for a four cylinder engine, a single timing flip-flop is used while in other embodiments, designed for eight cylinder engines, two flip-flops are used in a manner to permit overlap of the times of opening of the fuel injection valves. Additional features relate to the application of pre and post bias signals in combination with a short duration valve opening pulse in a manner to permit rapid and accurate control of the opening and closing of the injector valves.

3,820,199

MECHANICAL COUPLING MEANS

Jakhin Boaz Popper, Kiryat Motzkin, and Arie Ashkenazi, Haifa, both of Israel, assignors to The State of Israel, Ministry of Defence, Hakirya, Tel Aviv, Israel

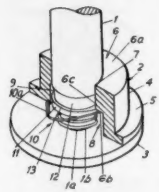
Filed Apr. 4, 1972, Ser. No. 240,964

Claims priority, application Israel, Apr. 12, 1971, 36590

Int. Cl. A44b *17/00*

U.S. Cl. 24—218 **4 Claims**

In combination, male and female coupling elements, a wall portion of said female element defining a receiving bore, a spring loop anchored to the female element so as to embrace said bore, an internal peripheral flange formed in the female element, embracing said bore and located between the loop and the mouth, said loop and/or said flange surrounding between 20 to 80 per cent of the periphery of said bore, and axially successive wide and narrow portions of the male element separated by a peripheral shoulder thereof, the loop and



the wide portion being so dimensioned that introduction of the male element into the bore causes an initial displacement of the loop so as to allow it to embrace the wide portion and a subsequent return displacement of the loop about the narrow portion whilst any subsequent axial withdrawal of the male element out of the bore is inhibited by the interposition of a portion of the loop between the flange of the female element and the shoulder of the male element.

3,820,200

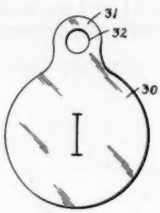
BAG CLOSURE

Robert E. Myers, 18506 Prince William Ln., Houston, Tex. 77058

Filed Jan. 3, 1973, Ser. No. 320,696

Int. Cl. A44b *21/00*; **B65d** *77/10*

U.S. Cl. 24—30.5 S **1 Claim**



A flat disc of resiliently flexible plastic material has a continuously uninterrupted peripheral edge and is provided at the center thereof with a I-shaped slit, the ends of which are spaced inwardly from the periphery of the disc. Portions of the disc at the opposite sides of the slit are deflectable to frictionally engage a compressed mouth portion of a bag inserted through the slit. In a modified embodiment, the disc is provided with two I-shaped slits intersecting each other at right angles. An apertured tab may be provided integrally at the periphery of the disc for hanging the same and the associated bag from a support.

3,820,201

LINK CONSTRUCTION FOR A CRYSTAL PENDANT

Carl Burckhardt, Wallisellen/ZH, Switzerland, assignor to Crystalon SA, Glarus, Switzerland

Filed Apr. 2, 1973, Ser. No. 347,223

Int. Cl. F21v *5/06*; **A44c** *11/00*; **A44b** *9/00*

U.S. Cl. 24—87 R **3 Claims**

The novel links of the present invention provide a decorative face on each side of the link. Each link comprises a pair of

identical elongated decorative members connected across the middle. From the middle outwardly toward each end, the members diverge in a V-shape, each end being provided with an integral tab bent angularly inwardly so that at each end a pair of tabs extend toward each other. Each crystal, glass or plastic, is provided with apposed openings. The tabs at each

end of the link are bent inwardly until they enter the crystal opening from each side into abutting or overlapping relation. The members are preferably narrower at the middle or waist at the point of connection. The preferred form is for an integral connection by using integral strips between the members. However, the connection may be by a rivet, weld, clamp, or any other suitable means.

3,820,202

SLIDER-OPERATED ZIP FASTENERS

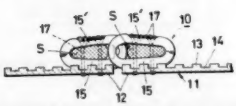
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 15, 1972, Ser. No. 263,099

Claims priority, application Japan, June 17, 1971, 46-51808; June 17, 1971, 46-51809

Int. Cl. A44b *19/02*

U.S. Cl. 24—205.1 C **6 Claims**



Improvements are provided in slider-operated zip fasteners for preventing the fastener elements from moving out of their proper position on stringer tapes. Alternate ridges and grooves are formed in the elements, which ridges and grooves are interengageable with corresponding grooves and ridges formed in the edges of the stringer tapes along which the elements are mounted, thereby eliminating the tendency of the elements becoming laterally displaced.

3,820,203

LOCKING SLIDERS

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

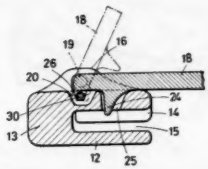
Filed Aug. 2, 1972, Ser. No. 277,293

Claims priority, application Japan, Aug. 4, 1971, 46-69598

Int. Cl. A44b *19/30*

U.S. Cl. 24—205.14 A **9 Claims**

Sliders for sliding clasp fasteners are provided with a recess of relatively narrow width extending transversely of the body of the slider for receiving a spring member cooperating with a pull tab in retaining the slider in locked position on the fastener. The spring-receiving recess is formed transversely of the slider and occupies a minimum proportion of area of the



slider structure to retain adequate mechanical strength thereof. It is nearly fully covered by the pull tab so as to prevent entry of foreign matters.

3,820,204

CLAW HOOK WITH AN AUTOMATIC SAFETY DEVICE

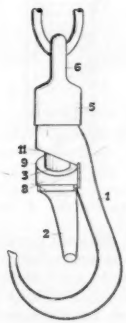
Orlando Scarpa, Venezia, Italy, assignor to Luciano Ciampi, Venice, Italy

Filed Mar. 20, 1973, Ser. No. 343,185

Claims priority, application Italy, Mar. 25, 1972, 84117/72

Int. Cl. A44b *13/00*

U.S. Cl. 24—232 **5 Claims**



A claw hook is described having a safety guard. The hook is pivotally mounted with respect to the guard, and, by virtue of an inclined plane arrangement, the hook and guard are automatically brought to a closed condition when the hook is connected to a load to be lifted and force is exerted on the hook through a lifting rope or cable.

3,820,205

METHOD OF SEALING A BURIAL CASKET

Richard N. Shaw, Amherst, N.Y., assignor to R. Thomas McClive, Kenmore, N.Y.

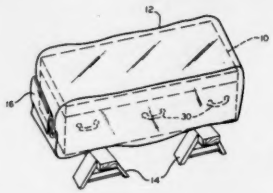
Filed Jan. 15, 1973, Ser. No. 323,871

Int. Cl. A61g *17/00*

U.S. Cl. 27—19 **1 Claim**

A casket sealed to prevent moisture from entering its interior, and the method of accomplishing the sealing. At graveside, the casket is placed in an elongated bag of impermeable,

shrinkable plastic material and the open end of the bag is closed. The casket is then lowered into a vault previously positioned in the excavation, and a substantially airtight cover is



placed on the vault. The cover includes means to enable the air within the vault to be heated in a controlled manner and this causes the plastic material in which the casket is encased to shrink into tight sealing engagement with the casket.

3,820,206

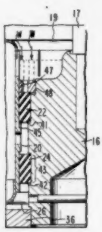
METHOD OF MAKING AN ELECTRON TUBE HAVING AN IMPROVED FILAMENTARY CATHODE AND SUPPORT THEREFOR

James P. Polese, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

Division of Ser. No. 777,747, Nov. 21, 1968, Pat. No. 3,737,711. This application Sept. 28, 1972, Ser. No. 293,216

Int. Cl. H01j 9/18

U.S. Cl. 29—25.15 **2 Claims**



An electron tube is disclosed comprising an evacuated envelope enclosing at least three cylindrical electrodes including a directly heated cathode, a grid and an anode. Cathode support means are disclosed comprising a generally cylindrical, metallic stem, a hollow, metallic support cylinder electrically connected to the cathode and coaxially situated about at least a portion of the stem in spaced relation therewith, and two dielectric annuli interposed between the stem and cylinder in abutment therewith.

A method of making the just described cathode support means, in which the stem and support cylinder have a coplanar step, is also disclosed comprising the steps of placing a dielectric annulus having a coefficient of thermal expansion less than the metallic stem and cylinder on the coplanar steps with the inner surface of the annulus in abutment with the cylindrical stem and the outer surface of the annulus in abutment with the hollow support cylinder, the stem and cylinder thereby occupying a first position with respect to the dielectric annulus. Two metallic rings are then placed upon the annulus with one ring in abutment with the cylindrical stem and the other ring in abutment with the hollow support cylinder. Mechanical force is then applied to the two metallic rings to push them firmly against the dielectric annulus. The electron tube is then heated causing the metallic stem and cylinder to expand and move with respect to the dielectric annulus and rings to a second position with respect thereto. The metallic ring in abutment with the stem is brazed thereto at the second position, and the metallic ring in abutment with the cylinder is brazed thereto at the second position. The electron tube is then cooled causing the stem and cylinder to return to their first position with the dielectric annulus compressed between the converging rings and steps and locked securely to the stem and cylinder. The mechanical force is then removed from the metallic rings.

3,820,207

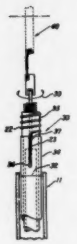
METHOD OF MANUFACTURING LAMP WITH FILAMENT SUPPORT STRUCTURE

Bruce E. Shanks, Wickliffe, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 223,433, Feb. 4, 1972, Pat. No. 3,784,865. This application Feb. 22, 1973, Ser. No. 334,666

Int. Cl. H01j 9/18

U.S. Cl. 29—25.15 **1 Claim**



A wire support for the filament of a tubular incandescent lamp having a pinch seal in which the wire support is formed with two transverse helical sections of several turns each with the sections having different diameters, the one of smaller diameter receiving the filament and the one of larger diameter engaging the inner wall of the envelope, the support being provided with a longitudinal tail section sealed in the press. In assembly, the helical section of larger diameter is twisted to reduce its diameter to enable passing the envelope over the wire support to a predetermined location within the envelope. The filament mount, lead-in conductors and filament are next passed through the support and positioned for subsequent pinch sealing.

3,820,208

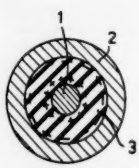
METHOD OF MANUFACTURING A PIEZOELECTRIC ELEMENT

Jean Baldy, Saint-Cyr-L'Ecole, France, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 184,695, Sept. 29, 1971, abandoned. This application Feb. 26, 1973, Ser. No. 335,943

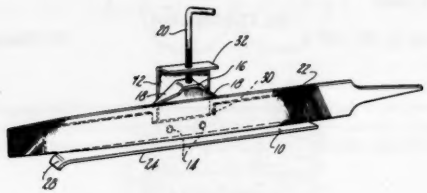
Int. Cl. B01j 17/00

U.S. Cl. 29—25.35 **1 Claim**



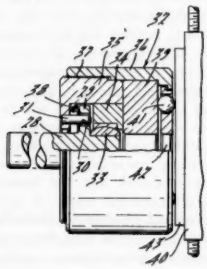
A coaxial cable whose dielectric consists of ceramic piezoelectric material. When a cable of this kind is loaded mechanically on an arbitrary point or over a given distance, a voltage can be measured at the ends between the central conductor and the envelope. The cable may alternatively be used for generating vibrations.

3,820,209
STRAIGHT EDGE FILE HOLDER
Dominic J. Panetta, 8109 Grayfield, Dearborn Heights, Mich. 48127
Filed Apr. 10, 1972, Ser. No. 219,982
Int. Cl. B23d *71/04*
U.S. Cl. 29—80 **3 Claims**



This provides a tool to hold any flat file comprising an angle plate, and a holding clamp and constructed of material that is light in weight and maintains strength. Means are incorporated in the tool to provide a true and square surface on the edge of any metal or wood stock.

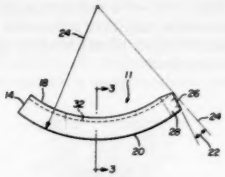
3,820,210
BURNISHING TOOL FOR A FLAT SURFACE
Stuart E. Kalen, Sterling Heights, Mich., assignor to Cogsdill Tool Products, Inc., Farmington, Mich.
Filed Nov. 10, 1972, Ser. No. 305,458
Int. Cl. B21c *37/30;* **B24b** *23/00;* **B21b** *13/20*
U.S. Cl. 29—90 **6 Claims**



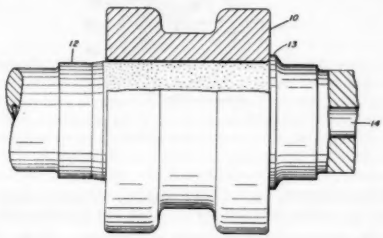
A burnishing tool has a head with an end face constructed to burnish flat surfaces through the driving of the head and the rollers or balls thereon which engage the surface to be burnished as the head is rotated and advanced thereover. The head is supported on a spindle through a universal joint which permits the rollers and balls to engage the surface with like pressures. A flange on the spindle has an aperture into which a pin supported by the head extends to produce a drive therebetween.

3,820,211
TOOL BIT
Walter C. Kus, 4310 N.W. 12th Ct., Fort Lauderdale, Fla. 33313
Filed Jan. 22, 1973, Ser. No. 325,401
Int. Cl. B26d *1/00*
U.S. Cl. 29—101 **9 Claims**

Lathe tool bit formed from stock having a curved and channeled configuration so that when given a simple grind or regrind forms a lathe tool having the machining characteristics of a skillfully and substantially optimally shaped lathe tool, and one which cuts equally well toward or away from the headstock of the lathe, and is also easily adjustable to the height desired relative to the work being turned.

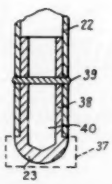


3,820,212
METHOD OF FORMING COMPOSITE ROLLS
Carl E. Spaeder, Jr., Monroeville Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Oct. 5, 1972, Ser. No. 295,390
Int. Cl. B23p *11/00;* **B21h** *1/14*
U.S. Cl. 29—148.4 D **10 Claims**



A method of forming a composite roll which has a hard wear resistant shell and a tough shock resistant arbor. The shell is adhesively affixed to the arbor, thus avoiding a shrink fit which places the shell under tension. The roll is adapted for use in applications where the arbor-shell interface reaches temperatures up to 400° F, and the adhesive must withstand these temperatures without breaking down. The preferred adhesive is a thermosetting epoxy material cured at an elevated temperature with an aromatic diamine.

3,820,213
METHOD OF MAKING A FUEL INJECTOR
Peter Michael Kent, Rugby, England, assignor to Brico Engineering Limited, Warwickshire, England
Division of Ser. No. 171,472, Aug. 13, 1971, Pat. No. 3,773,265. This application Dec. 15, 1972, Ser. No. 315,430
Int. Cl. B21k *1/20;* **B23p** *13/00*
U.S. Cl. 29—156.7 R **4 Claims**



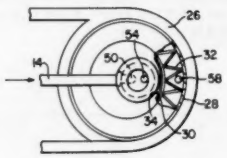
An electromagnetic fuel injector for a fuel injection system is provided with a solenoid winding which, when fed with elec-

trical operating current, produces a saturated magnetic field in at least part of a magnetic circuit, which field is used to attract a member controlling the valve means of the injector and hence the fuel flow. The valve means may include a plunger having a tip portion of a plastics or rubber-like material to engage the valve seat. Methods of attaching the tip portion to the plunger are also described.

3,820,214
METHOD OF FABRICATING A COOLING CHAMBER FOR A WATER COOLER

Carl E. Sholtes, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 116,793, Feb. 19, 1971, abandoned. This application Apr. 30, 1973, Ser. No. 356,673
Int. Cl. B21d *53/00*
U.S. Cl. 29—157.3 R **6 Claims**

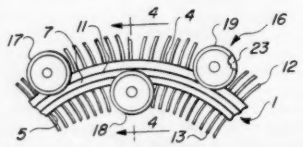


A relatively low cost cooling chamber formed of inner and outer concentrically disposed cylinders and opposite end caps for the outer cylinder, the ends of the outer cylinder being formed to provide seats which mechanically hold the end caps so that a low temperature bonding material may be used to provide the seal between the end caps and the outer cylinder and without the heating operation for effecting the bonding at the ends disturbing the bonding of other low temperature bonding material used previously to bond other parts of the chamber.

3,820,215
METHOD OF MAKING A CURVED SPINED HEAT EXCHANGER TUBE

Stephen F. Pasternak, Park Ridge, and Stephen F. Pasternak, Jr., Chicago, both of Ill., assignors to Peerless of America, Incorporated, Chicago, Ill.

Filed Apr. 27, 1973, Ser. No. 355,142
Int. Cl. B23p *15/26;* **B21d** *9/10*
U.S. Cl. 29—157.3 A **4 Claims**

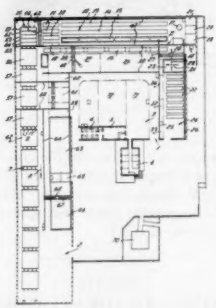


The method of making a curved, spined heat transfer element by applying bending forces only to portions disposed outwardly of the spines.

3,820,216
PRODUCTION LINES FOR THE MANUFACTURE OF PREFABRICATED BUILDINGS

Cornelis Van Der Lely, 7, Bruschenrain, Zug, and Hendricus Jacobus Cornelis Nieuwenhoven, Hirssattelweg, 6340 Baar, both of Switzerland

Filed Sept. 28, 1972, Ser. No. 292,871
Claims priority, application Netherlands, Oct. 1, 1971, 7113480
Int. Cl. B23p *19/04*
U.S. Cl. 29—200 A **30 Claims**



A production line for the manufacture of prefabricated building having a manufacturing line for the construction of floor, wall and ceiling elements wherein metal frames have concrete molded in place between them. The materials for the concrete and a concrete mixer are at one end of the manufacturing line and a buffer station is at the other where the concrete is allowed to harden and the components are connected to form the building sections. Adjacent the buffer station and perpendicular to the manufacturing line to form a L-shaped configuration is an assembly line along which travel sections which are connected as they will be in the finished building to receive wall and floor coverings, doors, windows and other components of the finished building. A gantry crane over the manufacturing line is capable of traveling above the initial part of the assembly line for transporting sections thereon to above the concrete mixer. A further line with a further crane for manufacturing the wall, floor and ceiling frames is perpendicular to the manufacturing line and opposite and parallel to the assembly line, and it also has a gantry crane carried on parallel tracks so that it can travel over the further line. Office and storage facilities are located between the assembly line and further line. Storage for the materials for the concrete is located near the concrete mixer and a wall of the building housing the production line.

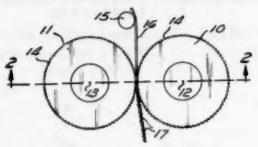
3,820,217
HEAT EXCHANGER TUBE AND APPARATUS FOR MAKING SAME

Herbert J. Venables, III, Hunting Valley, Ohio, assignor to The Venables Machine and Tool Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 135,183, April 19, 1971, Pat. No. 3,722,059. This application Oct. 16, 1972, Ser. No. 297,717
Int. Cl. B23p *15/26*
U.S. Cl. 29—202 D **10 Claims**

An improved spine finned heat exchanger tube and an apparatus for forming such tube is disclosed. The spine is formed by slitting a strip of metal from at least one edge toward the center by the use of cooperating cutter rolls which are connected by gearing to maintain a predetermined small clearance between the cutter teeth. Because the cutters are connected, the quality of the cut is improved, distortion of the

spine is reduced, and the cutting operation is not materially effected by variations of the quality of the stripped material. Further, cutter wear is reduced since the cutting teeth do not



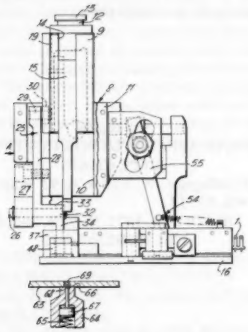
engage even when the cutters are run without stock. Less tearing and crystalization occurs at the junction between the spine and the base material providing greater heat transfer capacity.

3,820,218

TERMINAL INSERTING APPARATUS

Pedro Serrano, Barcelona, Spain, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 14, 1973, Ser. No. 332,536
Claims priority, application Spain, Feb. 29, 1972, 400262
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B **3 Claims**



Apparatus for inserting terminals into printed circuit boards comprises a reciprocable ram which actuates a shear block for shearing the leading terminal from a strip of terminals and which also actuates a punch for inserting the sheared terminal into a printed circuit board. The problem of transferring the sheared terminal to the punching station is solved by using a U-shaped member having two spaced arms extending from an intermediate straight portion. The shear block is slidable on the straight portion and a compression spring acting between one of the arms and the shear block biases the other arm towards the shear block to urge the leading terminal against the shear block which continues in the shear direction until the sheared terminal is aligned with the punch.

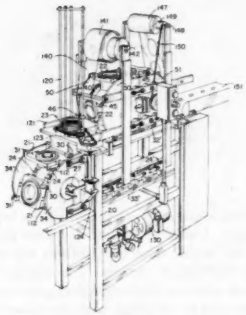
3,820,219

METHOD AND APPARATUS FOR MANUFACTURING CONTAINER LIDS HAVING TRANSPARENT WINDOWS

James L. Balch; James E. Anderson, and Charles J. Schroeder, all of Madison, Wis., assignors to Oscar Mayer & Co. Inc., Madison, Wis.

Filed Apr. 23, 1973, Ser. No. 353,881
Int. Cl. B23p *19/04, 17/00*
U.S. Cl. 29—208 R **8 Claims**

An apparatus for producing windowed container lids from a web of transparent film and preformed ring-shaped closure members having peripheral seal-forming channels for engaging the rims of containers comprises endless series of upper and lower die plate assemblies arranged on first and second continuous-loop conveyors so as to be periodically brought into mating engagement with the film web tautly disposed between. The lower die plate assemblies include annular recesses for receiving the closure members and a continuous knife edge circumferentially disposed thereto. The upper die plate assemblies include a reciprocatively mounted annular



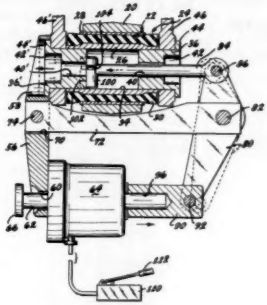
tamping die which, when actuated, extends into the peripheral channel of the closure ring. A stationary cam track disposed above the first continuous-loop conveyor momentarily actuates the tamping die while the die assemblies are in mating engagement to sever a window-sized sheet from the film web and tamp the margins thereof into the peripheral channel. Improved stability and accuracy is obtained by the provision of diagonally opposed rollers on the die plate assemblies and interlocking pin and socket assemblies therebetween.

3,820,220

TOOL FOR REMOVING BUSHING ADAPTORS

William A. West, 10219 Oro Vista Ave., Sunland, Calif. 91040

Filed Dec. 30, 1971, Ser. No. 214,057
Int. Cl. B23p *19/04*
U.S. Cl. 29—252 **11 Claims**



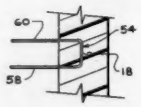
A tool for removing flanged end adaptor fittings from the ends of bushings in the ends of equalizer beams. The tool includes a body that engages the flanged end of the adaptor fitting which is flush against a part of the beam hanger supporting the bushing. The body supports a hydraulic ram which actuates a lever driving a stem which extends into the bore of the bushing for ejecting the adaptor fitting. The tool is adapted also to eject the adaptor fitting at the opposite ends of the bushing.

3,820,221

METHOD OF REPAIRING ARTICLES MADE OF HEAT-SOFTENABLE MATERIAL

William E. Mercer, 3121 Hopwell Pl., Toledo, Ohio 43606

Filed Apr. 5, 1973, Ser. No. 348,023
Int. Cl. B23p 7/00
U.S. Cl. 29—401 4 Claims



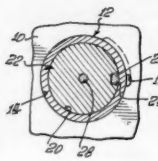
A method and apparatus are provided for repairing plastic eye glass frames. A wire is heated and then pressed into the frame across the break. The heat softens the plastic and the wire becomes embedded therein. The apparatus includes a hand piece from which a pair of friction grips extend; a power source is connected to the grips, with the power controlled by a switch in the hand piece. The wire can be supplied in a predetermined length and then formed into a U-shape by means of pliers, with the leg portions of the U-shaped wire then engaged by the friction grips. The switch is closed and the wire heated with the web portion between the legs pressed into the frame across the break. The switch is then opened and, after the wire is cooled, the hand piece and grips are removed therefrom. The wire legs can be cut off and filed smooth with the surface of the frame, if desired.

3,820,222

EXPLOSIVE FORGING OF EXTERNAL SURFACES

Irving Lieberman, Covina, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed July 13, 1973, Ser. No. 379,061
Int. Cl. B23p 17/00
U.S. Cl. 29—401 5 Claims



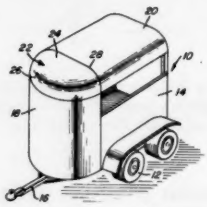
In order to block or fill erosion-produced channels in heat exchanger tube sheets, a plastic rod is provided for insertion into a tube in the exchanger adjacent the erosion channel. The rod peripherally carries an explosive so that the latter is placed in contact with the inner wall of the tube when the rod is inserted therein. The rod is oriented within the tube so that the explosive is adjacent the channel. When detonated, the explosive causes the outer wall of the tube adjacent the erosion channel to flow into the channel without significant distortion of the inner wall of the tube.

3,820,223

TRAILER CAP AND METHOD OF FORMING SAME

Clayton V. Cramb, Nashville, Tenn., assignor to Carlbuilt, Inc., Chickasha, Okla.

Filed Feb. 6, 1973, Ser. No. 330,077
Int. Cl. B23p 17/00
U.S. Cl. 29—415 1 Claim



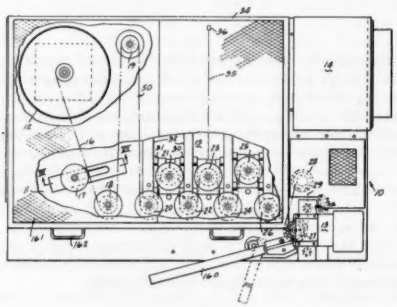
A trailer cap forming a closure between the roof and front end wall of a trailer of the type having a curved front end wall and a curved or bowed roof in which the cap is formed by a male and female die in a metal press.

3,820,224

METHOD AND APPARATUS FOR CUTTING ROLLER-TYPE CHAIN

Jerome J. O'Callaghan, W. 125 S. 6493 Whittier Ter., Hales Corners, Wis. 53715

Filed Oct. 25, 1972, Ser. No. 300,488
Int. Cl. B23p 19/02
U.S. Cl. 29—427 18 Claims



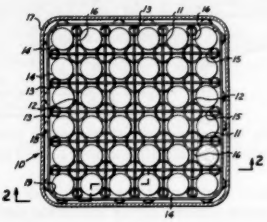
Roller type chain is cut into a selected number of shorter chains of selected length under the control of an electronic system which effects feeding the uncut chain about a sprocket at a work station and punching at least one roller pin from a link at the work station after each feeding operation. The sprocket at the work station functions in a multiple capacity in that it is driven to pull the uncut chain from a supply reel, accurately indexed to position a selected link at the work station and provides at least part of an anvil during the punching operation.

3,820,225

METHOD OF ASSEMBLING NUCLEAR REACTOR FUEL ELEMENT SPACER ASSEMBLY

Kumiy Roy Iwao, Lafayette, and David Yee, San Leandro, both of Calif., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 41,965, June 1, 1970, Pat. No. 3,746,617. This application July 12, 1972, Ser. No. 270,875
Int. Cl. B23p 19/00
U.S. Cl. 29—428 3 Claims



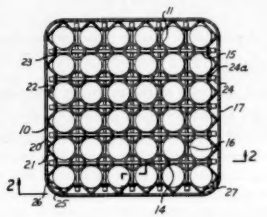
A nuclear reactor fuel element spacer arrangement having a fuel rods supporting and spacing means in the form of resilient slotted spacer tubes mounted on tie rods or bars secured to a supporting sleeve. The spaces between the spacer tubes are such that the fuel elements are gripped between adjacent spacer tubes or between spacer tubes and portions of the sleeve. The arrangement facilitates loading of the fuel elements and minimizes scratching of the fuel elements.

3,820,226

METHOD OF ASSEMBLING NUCLEAR REACTOR FUEL ELEMENT SPACER ASSEMBLY

Susumu Nakazato, Pittsburgh, Pa., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 41,967, June 1, 1970, Pat. No. 3,746,618. This application July 12, 1972, Ser. No. 270,876
Int. Cl. B23p 19/00
U.S. Cl. 29—428 3 Claims



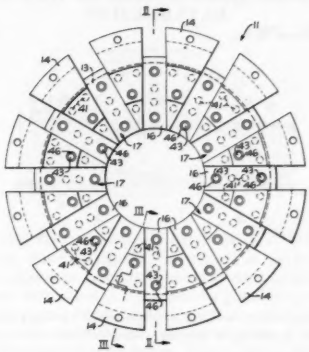
A nuclear reactor fuel element spacer arrangement having a fuel element supporting and spacing means in the form of spacer tubes mounted on tie rods or bars secured to a resilient supporting sleeve with the tie rods in tension. The spaces between the spacer tubes are such that the fuel elements are gripped between adjacent spacer tubes or between spacer tubes and portions of the sleeve. The arrangement facilitates loading of the fuel elements and minimizes scratching of the fuel elements.

3,820,227

CUTTER HEAD AND METHOD OF FORMING SAME

Joseph D. Menne, Canton, and George N. Sigulas, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 21, 1972, Ser. No. 317,162
Int. Cl. B23p 13/00
U.S. Cl. 29—445 2 Claims



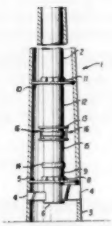
A cutter head for a gear cutting machine of the type wherein a plurality of cutting tools are mounted in radially movable and circumferentially spaced relation upon the head, the cutter head being formed from an annular pressure plate, a plurality of uniformly dimensioned, wedge-shaped tool slot separators and a plurality of uniformly dimensioned, generally rectangular tool slot spacers alternately arranged upon the annular pressure plate to form slots for receiving the cutting tools, the separators and spacers being heat treated prior to assembly upon the annular pressure plate, the separators and spacers being accurately positioned upon the pressure plate by alignment dowels surrounded by soft metal plugs and extending through coaxial bores in the pressure plate and the respective separators and spacers.

3,820,228

METHOD OF PROVIDING EXPANSIBLE CHIMNEYS

Randolph W. Snook, Yorktown Hts., N.Y., assignor to Pullman Incorporated, Chicago, Ill.

Division of Ser. No. 241,952, April 7, 1972, Pat. No. 3,782,266. This application Mar. 29, 1973, Ser. No. 346,113
Int. Cl. B23p 11/02
U.S. Cl. 29—446 8 Claims

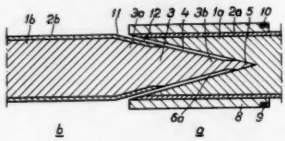


A lined chimney having upper and lower support means for the liner, and at least two expansion joints separated by toggle sections between the upper and lower liner supports, at least one expansion joint having plural expansible or compressible hangers on the exterior thereof, and a method for providing the same.

3,820,229
METHOD OF JOINING WIRE OF COMPOUND MATERIAL

Hans Larker, and Jan Nilsson, both of Robertsfors, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Feb. 5, 1973, Ser. No. 329,858
Claims priority, application Sweden, Feb. 11, 1972, 1652/72
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 **2 Claims**

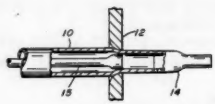


In joining wire of a compound material having a core of aluminum and a casing of copper, two wire ends to be joined are formed with a conical male part and a female part with a conical recess. The copper casing covers a part of the conical point of the male part. A sleeve of explosive is applied around the joint and detonated to join the core and casing by explosion welding.

3,820,230
METHOD OF STARTING TUBES THROUGH DRAWING DIE

Samuel Katunich, Baldwin Borough, and George C. McKelvey, Port Vue Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 53,602, July 9, 1970, abandoned. This application Jan. 17, 1973, Ser. No. 324,275
Int. Cl. B23k *27/00*
U.S. Cl. 29—470.3 **2 Claims**



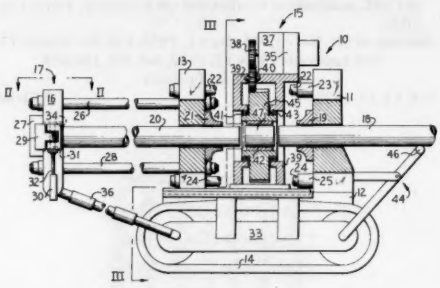
A pre-formed point member is welded onto the leading end of a pipe prior to cold drawing of the pipe and recovered for reuse after the drawing operation. This point member is capable of being cold drawn through numerous reducing dies without being replaced.

3,820,231
INERTIA WELDING METHOD FOR PIPELINES

Ira H. Sage, Peoria, Ill., assignor to Production Technology Inc., Peoria, Ill.

Continuation of Ser. No. 176,971, Sept. 1, 1971, abandoned, which is a continuation of Ser. No. 828,479, May 28, 1969, abandoned. This application Aug. 2, 1973, Ser. No. 384,917
Int. Cl. B23k *27/00*
U.S. Cl. 29—470.3 **3 Claims**

A center-drive inertia welder mounted on a vehicle and comprising a rotatable chuck mounted between a fixed chuck and an axially-movable chuck and having a hydraulic system for moving a workpiece in the axially-movable chuck against

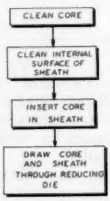


the workpiece in the rotatable chuck and for moving the workpiece in the rotatable chuck against the workpiece in the fixed chuck.

3,820,232
METHOD FOR FORMING COMPOSITE WIRE

Robert R. Brenan, Warren, Pa., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Nov. 13, 1972, Ser. No. 305,846
Int. Cl. B23k *31/02*
U.S. Cl. 29—474.4 **10 Claims**



There is disclosed a method for producing a composite wire having an outer sheath of copper and an inner core of a metallic material dissimilar to copper wherein the external surface of the core is cleaned, coated with a relative thin coating of copper and inserted into the copper sheath. The sheath itself is cleaned internally prior to the insertion whereupon both core and sheath are drawn through a reducing die which substantially reduces the cross-sectional area of the sheath.

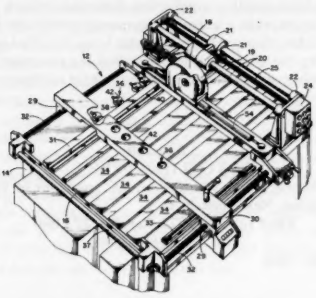
3,820,233
PRECISION CUTTING TOOL

John W. Baker, 4 Wachusetts Dr., West Acton, Mass. 02173

Filed July 20, 1972, Ser. No. 273,385
Int. Cl. B23q *23/00*
U.S. Cl. 29—566 **31 Claims**

Apparatus for precision cutting of sheet material (e.g. nonferrous metals such as aluminum, brass, asbestos board, or the like), comprising a work-support table, displacement-sensing means mounted along two adjacent sides of said support table and a novel quick-clamping means for holding a workpiece

against said table. The quick-clamping means has an elongate clamp bar along each side of the cutting tool, these elongate



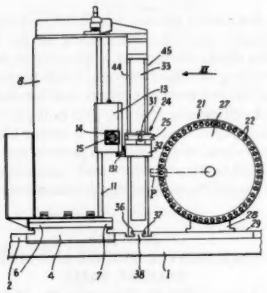
bars comprising biased means therealong for compensating for differences in thickness along the length of said workpiece.

3,820,234

MACHINING CENTER WITH AUTOMATIC TOOL-CHANGER

Rene Poincenot, Paris, France, assignor to Societe Anonyme dite: Ratier-Forest, Paris, France

Filed Dec. 6, 1971, Ser. No. 205,011
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 **7 Claims**



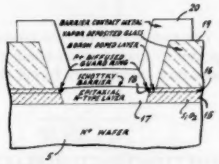
Some conventional machining centers with automatic tool changer have a rotary tool-carrying spindle mounted in a headstock which is movable up and down a column while a tool magazine is provided with tool storage sockets the axes of which are parallel with the spindle axis. The tool change system comprises a tool change arm with two grips for replacing a tool in the spindle by another tool withdrawn from the magazine. The tool change system is located in immediate proximity to the tool magazine so that each time the tools have to be interchanged, it is necessary for the headstock to be moved away from its work position to a location close to the tool magazine and thereafter it has to be moved again back to its work position. Such movements of the headstock are time wasting all the more because the headstock is generally a very heavy member. This is detrimental to the efficiency of the machine and to the accuracy of the work being carried out. In order to remove such drawbacks the tool change system disclosed comprises a tool transfer unit which is vertically movable on a tower located between the magazine and the vertical path of travel of the headstock and which carries a tool change arm capable of reaching the spindle and the magazine. Thus the tool transfer unit takes the tools from the spindle to the magazine and back from the magazine to the tool spindle without any need for the headstock to be moved away from and back to its working position.

3,820,235

GUARD RING STRUCTURE FOR MICROWAVE SCHOTTKY DIODE

Richard L. Goldman, Sunnyvale, Calif., assignor to Philco-Ford Corporation, Blue Bell, Pa.

Filed May 21, 1973, Ser. No. 361,873
Int. Cl. B01j *17/00*
U.S. Cl. 29—578 **4 Claims**



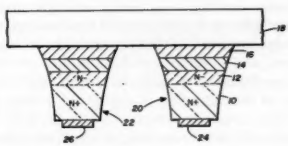
A process for automatically establishing a P-N junction guard ring during epitaxial deposition of semiconductor material suitable for Schottky barrier diode formation. Since no separate diffusion step is required for guard ring formation, the process is simplified and a very narrow guard ring can be employed. This is highly useful in very small diode structures, such as are employed at the higher microwave frequencies.

3,820,236

METHOD OF MAKING METAL SEMICONDUCTOR DIODES HAVING PLATED HEAT SINK MEMBERS

Roland H. Haitz, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 835,180, June 20, 1969. This application Mar. 31, 1972, Ser. No. 239,989
Int. Cl. B01j *17/00*
U.S. Cl. 29—583 **5 Claims**



A significant improvement in the heat flow resistance of microwave diodes may be achieved by plating a heat sink to the metal layer of a Schottky barrier structure. A semiconductor substrate has an epitaxial layer grown thereon in accordance with standard epitaxial procedures. The Schottky barrier is then fabricated by properly preparing the surface of the epitaxial layer and then evaporatively depositing a layer of metal at a temperature such that the metal nucleates to form a very thin film to produce a rectifying contact with the epitaxial layer. A heat sink material is then plated onto the metal film of the rectifying contact to a thickness sufficient to insure heat conduction away from the Schottky barrier. Typically, the heat sink may be plated copper.

3,820,237

PROCESS FOR PACKAGING LIGHT EMITTING DEVICES

Dennis Effer, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Division of Ser. No. 144,012, May 17, 1971, abandoned. This application June 26, 1972, Ser. No. 265,983
Int. Cl. B01j *17/00*
U.S. Cl. 29—588 **7 Claims**

A package for a light emitting device is fabricated from a lead frame structure having a pair of electrodes. The end of

one of the electrodes of the lead frame is shaped concavely to form a reflector having a predetermined shape. A semiconductor element is bonded to the interior surface of the reflector and electrically connected by a wire to one end of the

other electrode. The ends of the two electrodes are mechanically secured together in spaced relationship by a transparent encapsulating substance which also forms the lens for the device.

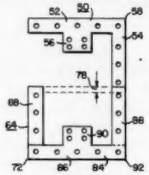
3,820,238

METHOD OF CONSTRUCTING ELECTRICAL APPARATUS

William R. Caputo, Wycoff, and Clyde M. Mullis, Glen Rock, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 17, 1973, Ser. No. 361,088

U.S. Cl. 29—606 **9 Claims**



A method of constructing electrical apparatus having a gapped magnetic core structure comprising upper and lower yoke portions, first and second outer leg members, and a gapped inner winding leg, using similarly dimensioned F-shaped laminations. Four F-shaped laminations, two of which are reversed, are assembled to provide a basic group of laminations, and a plurality of basic groups are superposed to provide a preliminary rectangular structure of frame in which the length of the outer legs is almost twice their dimension in the final core structure, which provides an inner leg having a gap therein sufficient to receive an associated electrical winding. The preliminary structure is then compressed to its final dimensions to cause the inner winding leg portions to advance into the electrical winding and provide a non-magnetic gap therein.

3,820,239

METHOD OF MANUFACTURING THERMISTOR

Yasushi Nagata, 520 Machiya, Urawa, Japan

Division of Ser. No. 325,655, Jan. 22, 1973. This application July 3, 1973, Ser. No. 376,133

Int. Cl. H01c *7/04*

U.S. Cl. 29—612 **2 Claims**

The disclosure is directed to thermistors for temperature measurement and method of making the same, wherein the yield in the manufacture is very high and the choice of the products can be made in the midway of the manufacture so that small-sized thermistors having little change in the resistance for the long use can be obtained inexpensibly, said thermistors being usable at a high temperature. The method includes the steps of forming a disc-shaped thermistor body, coating a heat resisting conductive material on both sides of the body to provide electrodes, connecting metallic leads to the electrodes, disposing the resultant body in a glass member, and heating the glass member to embed the resultant body in the glass while simultaneously firing the heat resisting conductive material.

3,820,240

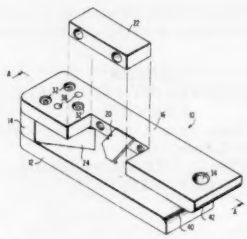
WEB CUTTING DEVICE

John A. Witsell, North Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed July 19, 1972, Ser. No. 273,060

Int. Cl. B26b *29/00*

U.S. Cl. 30—294 **1 Claim**



There is disclosed a cutting device for severing the wet felt webs of a paper machine. The cutting device is a U-shaped blade holding frame comprising, a top portion having a transversely extending slot therethrough, a butt portion connecting said top portion to a bottom portion, said top and bottom portions spaced sufficiently apart by said butt portion to accommodate a felt paper machine web, a cutter blade extending from the transverse slot in said top portion and held in place thereby to said bottom portion, and means attached to said top portion for pulling said cutting device across said web.

3,820,241

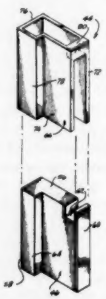
REMOVABLE DENTAL BRIDGE AND METHOD FOR MAKING SAME

Mervyn C. Lasky, 1535 N. Poinsettia Pl., Hollywood, Calif. 90046

Filed Feb. 22, 1973, Ser. No. 334,729

Int. Cl. A61c *13/22*

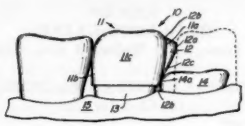
U.S. Cl. 32—5 **14 Claims**



A patient-removable dental bridge includes a male support member mounted on an abutment tooth to serve as a bridge

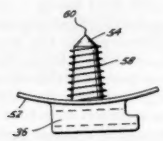
support, and a female mounting member embedded in an artificial tooth and including a socket to be releasably engaged with the male member. The male member is a solid piece extending about one-half the width and the entire height of the artificial tooth. A narrow and shallow notch is located in the top edge of the male support member, preferably near the corner adjacent the abutment tooth. A transverse bridge piece in the top of the female member fits into the notch when the two members are engaged to act as a stop against movement of the artificial tooth into the gum tissue. A tension bar disposed between the male and female members provides proper tension between the two members and can be adjusted to compensate for wear. The two members are made by trimming plastic male and female dies into the desired shapes. The male support member is cast from the male die, and the female die is then fitted onto the cast male member to facilitate forming the bridge piece. The female mounting member is then cast from the female die.

3,820,242
PREVENTIVE ORTHODONTIC APPLIANCE
Richard C. Haskins, 1421 Wilton Way, Salt Lake City, Utah 84108
Filed Feb. 28, 1973, Ser. No. 336,738
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A **1 Claim**



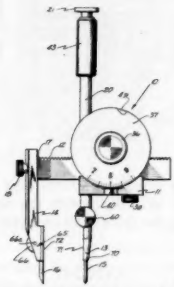
A tooth guidance appliance for attachment to a dental patient's tooth for distally guiding a second eruptive tooth adjacent thereto to a proper mouth location, and is particularly applicable to guiding eruptive first teeth of children and second teeth of young adults.

3,820,243
TYPODONT BRACKET
Fred Frank Schudy, 2615 Cameron, Houston, Tex. 77006
Filed June 26, 1973, Ser. No. 373,678
Int. Cl. A61c *9/00*
U.S. Cl. 32—71 **1 Claim**



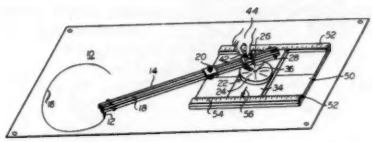
The typodont bracket includes a bracket secured to an arcuate base plate having a threaded screw attached thereto for threadingly engaging a typodont tooth whereby the bracket may be secured to the tooth.

3,820,244
DIAL COMPASS
Warren D. Novak, 325 Douglass Rd., Chappaqua, N.Y. 10514
Filed May 4, 1971, Ser. No. 140,068
Int. Cl. B43l *9/04*
U.S. Cl. 33—27 C **13 Claims**



A dial compass for effecting precise displacement of two pointed elements of a compass upon rotation of an indicia bearing dial.

3,820,245
DRAWING PROJECTOR FOR REPRODUCING CURVES
Dominic F. Yozzo, Tappan, N.Y.
Filed June 26, 1973, Ser. No. 373,657
Int. Cl. B43l *11/04*
U.S. Cl. 33—27 R **10 Claims**

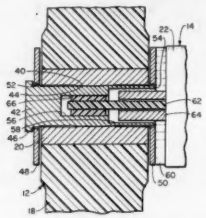


This drawing apparatus has adjustable mechanism for guiding a scriber to make curved lines and closed areas of different shapes over a wide variety. The adjustments are graduated and can be set to reproduce a predetermined curve or closed area. An element that moves in a circle on an adjustable base is connected with a scriber by a beam which is angularly movable and also movable in the direction of its length. This provides a simple and accurate mechanism for projecting the scriber along a desired path.

3,820,246
MEASURING WHEEL STRUCTURE
Wallace D. Evans, Jr., Malibu, Calif., assignor to Rolatape Corporation, Santa Monica, Calif.
Filed Apr. 12, 1973, Ser. No. 350,366
Int. Cl. G01b *3/12*
U.S. Cl. 33—141 R **7 Claims**

A measuring wheel structure wherein a wheel is employed which has a central aperture, a bifurcated bracket having a pair of spaced apart legs with each leg having an opening therein, the wheel being located between the legs with the central aperture of the wheel being in alignment with the openings in the legs, a sleeve located within the central aperture, the sleeve including knurling thereabout to fixedly secure the wheel to the sleeve, the sleeve including a central

interior chamber, a counter mechanism connected to the bracket with the drive shaft of the counter mechanism extending into the interior chamber, a vinyl tube extending around the drive shaft and in contact with the wall of the interior chamber for causing the drive shaft to rotate with the sleeve.



3,820,247

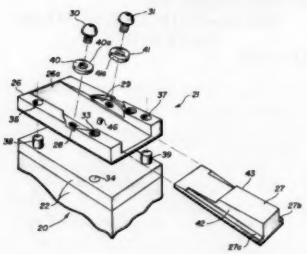
SOLID ADJUSTABLE MECHANISM FOR INFINITE HEIGHT SETTING

Morris Dick Casey, and Richard W. Casey, c/o Casey Tools & Die Co. M-40 South, Dowagiac, Mich. 49047

Filed Dec. 4, 1972, Ser. No. 312,040

Int. Cl. G01b *3/30*

U.S. Cl. 33—174 S **9 Claims**



The present disclosure is directed to an adjustable mechanism capable of achieving infinite height settings. This mechanism may be employed as a supporting or spacer block for various machining operations, or as a gauge block for inspection or other measuring functions. In the present disclosure, said mechanism is described and illustrated as a sine plate supporting block. In this regard, the mechanism or supporting block is used by a machinist in adjusting the elevation of a tiltable plate member of a sine plate machine tool. The supporting mechanism may include a plurality of discrete bottom base supports of different thickness so that large incremental changes in the overall height of the mechanism can be achieved in multiples of the thickest to the smallest base support. Primarily the assembly comprises a slide housing which receives a slide element transversely movable therein so that the top surface of the slide element moves vertically upwardly and downwardly relative to the slide housing and is at all times parallel to the bottom surface thereof. The slide housing has an inclined surface which has the direction of inclination transverse to the support bar of the upper member of the machinist's sine plate. The slide member is securely held in position by a pair of lock bolts which are angled to be perpendicular to the inclined surface, and there is provided washers having flat edge sections engaging the sides of the slide so as to prevent turning of the washers during tightening of the lock bolts, which might upset the height setting.

3,820,248

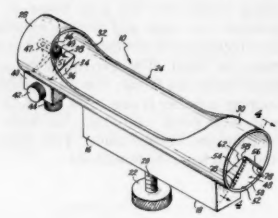
ILLUMINATED GUN SIGHT

Norman G. Hayward, Rt. 2, Box 119G, Manassas, Va. 22110

Filed Dec. 23, 1971, Ser. No. 211,604

Int. Cl. F41g *1/32, 1/42*

U.S. Cl. 33—241 **3 Claims**



An illuminated gun sight assembly for use with firearms under conditions of restricted light has a sight tube having front and rear sight means. The rear sight means has angularly related bores which house a luminescent substance, and openings expose the substance as two lines of light dots. The forward sight means includes a luminous member visually alignable between the lines of light dots.

3,820,249

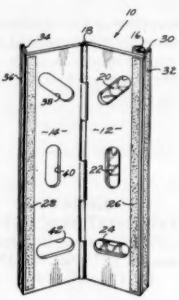
SELF-GRIPPING LEVEL

Theodore M. Stone, 1130 Wellwood Ave., Beaumont, Calif. 92223

Filed Oct. 16, 1972, Ser. No. 297,893

Int. Cl. G01c *9/28*

U.S. Cl. 33—347 **2 Claims**



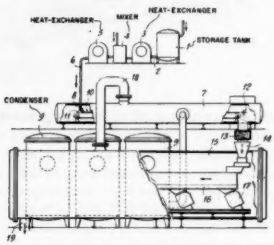
An ironworker's spirit level having a pair of flat, equally sized rectangular members hinged together along adjacent sides to turn about a common axis. The two rectangular members have front surfaces which fold together about the hinge axis and there are a pair of strips of magnetic material mounted in receptive grooves near the outer edges of the surfaces of the plate-like members so as to come together when these members are folded to a closed position. The strips of magnetic material permit the spirit level to be affixed to an upright pipe in parallel relationship to the axis of the pipe so that the tool can be held in position while the pipe is adjusted for verticality. Behind the upper front corner of one of the plate-like members a bulls-eye level is fixed in position so as to be readable from above. The tool can thus be installed on a pipe by means of its magnetic strips and the pipe can then be

adjusted to the vertical position by observance of the bulls-eye level. Bubble vials of conventional type can be mounted in appropriate openings in one of the plate-like members in, for example, longitudinal, transverse, and 45° angular relationship with that member. Also, appropriate window openings can be cut in the other plate-like member to permit reading of the bubble vials from either side of the spirit level when it is installed for use on the job.

3,820,250
FREEZE-DRYING PROCESS

Abraham Rudolph Mishkin, Chappaqua, N.Y., and James Leroy Anderson, Marysville, Ohio, assignors to Societe D'Assitance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Filed Sept. 28, 1970, Ser. No. 76,028
Int. Cl. F26b *5/06;* **A23f** *1/08, 3/00*
U.S. Cl. 34—5 **5 Claims**

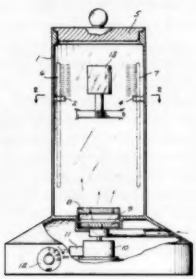


Tea or coffee extracts are cooled and frozen under reduced pressure prior to freeze-drying. Other features of the invention appear in the following specification and drawings.

3,820,251
TOOTHBRUSH DRYING DEVICE

Harlan O. Abernathy, Vancouver, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 27, 1973, Ser. No. 345,265
Int. Cl. F26b *19/00*
U.S. Cl. 34—60 **2 Claims**

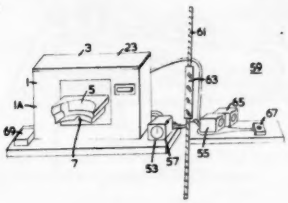


A toothbrush drying device comprises a housing having toothbrush accommodating means therein and a removable cover. A heater in the housing heats the air in the housing thereby drying toothbrushes in the housing. A selectively adjustable control device coupled to the heater controls the duration of heating. A source of ultraviolet light in the housing in proximity with the toothbrush accommodating means destroys bacteria on toothbrushes in the housing.

3,820,252
HUMAN REACTION MEASURING MEANS

Ivan Toby Rutner, 333 Baltimore Rd., Winnipeg, R3L-1J2 Manitoba, Canada

Filed Feb. 6, 1973, Ser. No. 330,084
Int. Cl. G09b *19/00;* **A01k** *5/00*
U.S. Cl. 35—22 R **6 Claims**

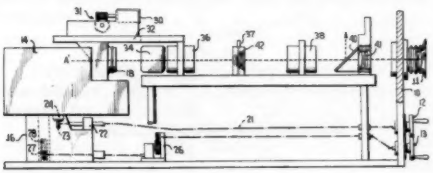


This invention relates to means for the measurement of human reactions, the reactions concerned being the reactions of interest or of aversion experienced by a human when he is caused to view some object, animal or scene having special connotations. Human reaction measuring means are described which include viewing means by which a selected scene can be viewed, and first initiating means by which viewing of the viewing means can be rendered effective by a potential viewer to permit viewing of the selected scene. Signal means are provided by which the potential viewer can be instructed to operate the first initiating means, and timer means are provided by which at least the time interval between operation of the first initiating means and operation of the second terminating means can be ascertained.

3,820,253
GUNNERY TRAINER

Ronald R. Willey, Indialantic, Fla., assignor to Willey Corporation, Melbourne, Fla.

Filed Mar. 24, 1972, Ser. No. 237,625
Int. Cl. F41g *3/26*
U.S. Cl. 35—25 **14 Claims**



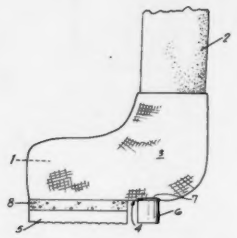
A burst-on-target gunnery simulator, particularly suitable for training tank gunners, includes a slide projector for projecting realistic target scene images through a reticle slide to an eyepiece for a gunner-trainee. The projector is movable under trainee control to permit movement of the target scene relative to the reticle, thereby giving the trainee the feeling of gun movement. A laser beam is momentarily combined with the target image in response to operator actuation of a firing mechanism, thereby optically simulating a gun burst on the viewed target scene. By noting where the burst falls the trainee can re-aim the gun, i.e., re-position the projector, as needed to hit the target with the next round. The target scene and burst is also viewable on an instructor's screen. Instructor-operated controls permit the laser mount to be moved relative to the target to simulate various firing trajectories and wind conditions. The instructor is provided with a control which permits the laser burst to be blocked from the trainee's view without impairing the burst image on the instructor's screen.

3,820,254

FOOT CAST SHOE TYPE COVER

John Kopacsi, Toronto, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 28, 1973, Ser. No. 401,674
Int. Cl. A43b
U.S. Cl. 36—2.5 R 5 Claims



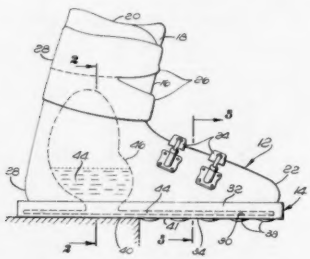
A foot cast shoe type cover for covering a foot encased in a cast comprises a sock type foot cover of stretchable waterproof material having a sole part. A shoe type sole and a heel accommodating hole are provided on the sole part of the foot cover.

3,820,255

RIGID BOOT CONSTRUCTION WITH SELF-CLEANING SOLE

Lon R. Davis, 11116 Cumpston St., North Hollywood, Calif. 91601

Filed Mar. 8, 1973, Ser. No. 339,250
Int. Cl. A43b *00/00*
U.S. Cl. 36—2.5 AL 9 Claims



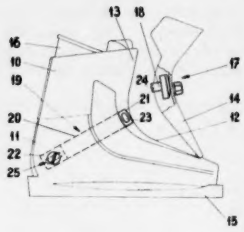
A shoe or boot construction is disclosed incorporating a rigid sole (as for wear while skiing) and possessing a self-cleaning capability. Structurally, the sole incorporates external flexible-wall areas or spaces along with means for flexing these areas to removed foreign matter, e.g. ice or snow. As disclosed, flexible-wall spaces are provided on the bottom of the sole and are backed by an elongate flat cavity that functions as a fluid reservoir. As the wearer of the boot moves about, varying pressures are applied to the fluid reservoir which result in flexure of the spaces to remove snow and ice. Springs are also incorporated to accomplish more reliable flexure and furthermore as disclosed, a fluid bladder is coupled to the fluid reservoir within the sole that may be impacted to develop a fluid-pressure shock for additionally distorting the flexible sole sections and thereby removing foreign matter. Various operating fluids may be employed in the construction as disclosed, including silicone liquid.

3,820,256

PLASTIC LATCH FOR SKI BOOT

Robert Schoch, Singen/Hohentwiel, Germany, assignor to Weinmann Aktiengesellschaft, Schaffhausen, Switzerland

Filed June 11, 1973, Ser. No. 368,943
Claims priority, application Germany, June 26, 1972, 2231221
Int. Cl. A43b
U.S. Cl. 36—2.5 AL 3 Claims



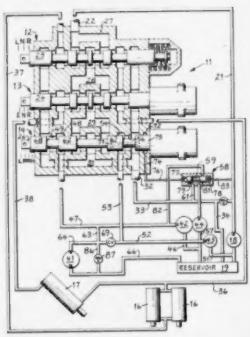
A ski boot comprising a closure arrangement including a pair of retaining strips arranged on both sides of the inner side of the boot for substantially on their entire length, each of the strips have an end portion directed away of the heel portion of the boot and, another end portion which is secured to the shell of the shoe at a location lying half-way between the first mentioned free end of the strip and a middle portion of the back of the heel portion of the boot.

3,820,257

SELF-LOADING SCRAPER HYDRAULIC CONTROL SYSTEM WITH AUTOMATIC LOAD RELIEVING CIRCUIT

John A. Junck, 904 Allan Dr., and James E. Scheidt, 100 Olympia St., both of Joliet, Ill. 60435

Filed Dec. 23, 1971, Ser. No. 211,218
Int. Cl. B60p *1/36*
U.S. Cl. 37—8 6 Claims



A hydraulic circuit is described for driving the bowl positioning and ejector mechanisms of an earth scraper vehicle, as well as for driving a scraper elevator mechanism at three different speeds. The circuit includes four hydraulic pumps driven by the scraper tractor engine providing sources of fluid pressure to operate the various mechanisms, and a composite control valve for selectively directing fluid pressure to each of the mechanisms when it is desired to actuate the same. A diverter valve is also provided for diverting from the elevator

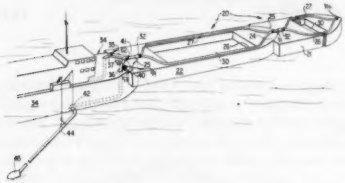
mechanism the fluid pressure of one of the pumps whenever the elevator is operating at its highest speed and either the bowl or ejector mechanism is actuated. The tractor engine is therefore not required to drive all four pumps against back pressure at the same time.

3,820,258

APPARATUS AND METHOD FOR DREDGING, RETENTION, TRANSPORT AND DISPOSAL OF DREDGED MATERIAL

Willard F. Fahrner, 2905 Spring Park Rd., Jacksonville, Fla. 32207

Filed Oct. 31, 1972, Ser. No. 302,543
Int. Cl. E02f *3/88*; **B63b** *21/62*, *35/28*
U.S. Cl. 37—58 **7 Claims**



A system of subaqueous excavation and material removal having the combination of a hopper dredging vessel, hopper barges with independent dumping capacity and a prime mover vessel such as a tug, each barge having a stern notch and a bow portion which is contoured to be received in a like stern notch of an adjacent barge so that two or more barges can be arranged in an assemblage, end-to-end with bow portions fitting into the stern notches. The dredging vessel and prime mover vessel also have like bow portions whereby they can connect into the assemblage. By transporting filled assemblages from the dredging vessel for dumping and replacing same by empty assemblages the dredging vessel may continue its operation on practically a 24 hour basis. Rapid and effective securing of the assemblage, the dredging vessel and prime mover vessel are obtained through pneumatic fenders attached to the sides of the stern notches and a pneumatically controlled cushioning fender couple attached to the stem which is received between vertical expansible fenders at the apex of the stern notch. By expansion of the fender couple and the apex fenders the vessel is effectively secured to the assemblage. In order to separate the assemblage and the vessel, the fender couple and the tubular members are deflated. Conduits to carry dredged material are located on each barge and the dredging vessel. Each has a tubular outlet extending proximate the bow portion which is received in a larger tubular inlet extending proximate the stern notch, there being an arrangement of annular members about the engaging conduit means which are expansible and securely connect the conduits together whereby dredged material may be delivered from the dredging vessel simultaneously to each of the barges in the assemblage. The connection of the units is accomplished without any rigid structural linkage over a relatively broad and large surface to surface area whereby unwanted redundancy of strength at the connection is largely eliminated.

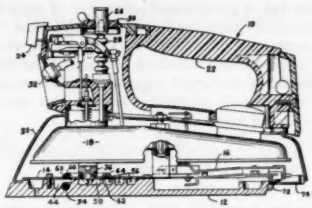
3,820,259

ELECTRIC STEAM IRON

Theodore Robert Flowers, Fairfield, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Jan. 2, 1973, Ser. No. 320,444
Int. Cl. D06f *75/05*
U.S. Cl. 38—77.5 **5 Claims**

Steam iron is equipped with second steam-generating chamber capable of generating a blast of steam which is communicated to steam channel at toe of iron to focus blast for better directing by housewife. Unpluggable vents at rear end



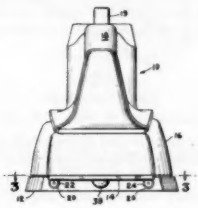
of steam channel permit flushing of lint and dirt out heel of iron to keep them off sole plate ironing surface.

3,820,260

STEAM PRESSING IRON HAVING SELF-CLEANING MEANS

Theodore Robert Flowers, 92 Lounsbury Rd., Fairfield, Conn. 06430

Filed May 22, 1973, Ser. No. 362,661
Int. Cl. D06f *75/38*
U.S. Cl. 38—93 **4 Claims**



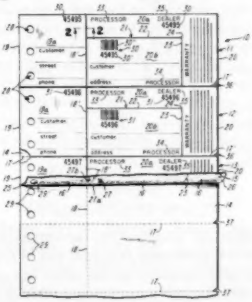
A steam pressing iron has flush ports in the rear of the soleplate. A pair of arms mounted on a pin at the center of the heel plate of the iron carries plugs to close the ports. A single operator button moves the arms to swing the plugs into or out of the ports.

3,820,261

COMPOSITE WEB OF RECORD ASSEMBLIES

Ninian Beall, Jr., Paterson, N.J., assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed July 19, 1972, Ser. No. 273,238
Int. Cl. A44c *3/00*
U.S. Cl. 40—2 **14 Claims**



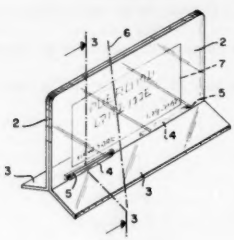
There is disclosed a method of making a composite web of record assemblies. The method comprises the steps of provid-

ing a composite web including a web of supporting material and a web of pressure-sensitive label material adhered to the supporting material. By practicing the steps of the method, the composite web is transformed into a web of separable record assemblies each having separable record sections. One record section carries one record member and another record section carries a pair of record members. The record members of each record assembly are keyed together with information which renders it especially useful by dealers who send out their customers' work for processing.

3,820,262
DISPLAY DEVICE

Paul Dewsnap, New York, N.Y., assignor to Donaldson Display Company, Inc., New York, N.Y.

Filed Apr. 6, 1972, Ser. No. 241,657
Int. Cl. G09f 3/18
U.S. Cl. 40—10 D **10 Claims**

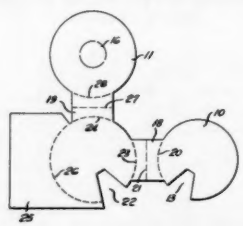


A display device is provided constituted of a pair of members disposed with upstanding sections thereof in normal contiguous relation. These sections are adapted for spreading apart to permit ready insertion of a display between the sections which act as protective covers for the display.

3,820,263
DIALS AND METHODS OF MAKING THEM

Charles F. Clark, 99 Avendale Rd., Yonkers, N.Y. 10710

Continuation-in-part of Ser. No. 795,305, Jan. 30, 1969. This application June 7, 1971, Ser. No. 150,538The portion of the term of this patent subsequent to Sept. 13, 1988, has been disclaimed.
Int. Cl. G09f 11/04
U.S. Cl. 40—70 **7 Claims**



A dial suitable for calculations, demonstrations, teaching and amusements is composed of a front disc, a rear disc and an inner disc rotatable relatively to the other two discs and having indicia visible through a window provided in the front disc and possibly the rear disc. According to the method of the present invention the rotation of the inner disc is made possible by cutting a central circle in the inner disc which, however, is connected to it by thin tabs, gluing the central circle to the front and rear discs and then breaking all the tabs by turning the inner disc. According to another feature, all three discs are initially cut from a single sheet and joined by strips which are folded when the discs are assembled. The fold connected to the rear disc may be extended to form a sheet which may be conveniently glued or stapled inside or outside a magazine or book to form an integral part of the publication. According to a further embodiment two such dials may be joined by a folded sheet portion

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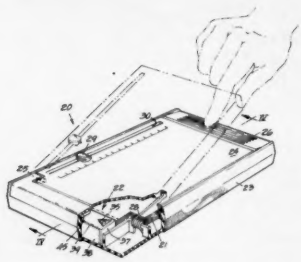
3,820,264
LIST FINDER WITH INSERTABLE INFORMATION CARDS

Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Company Ltd., Tokyo, Japan

Filed Dec. 20, 1972, Ser. No. 316,815
Int. Cl. B42f 21/00
U.S. Cl. 40—104.01 **17 Claims**

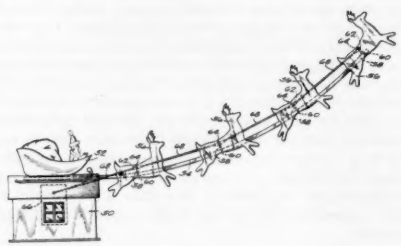


A list finder comprises a holder having a releasable cover pivotally mounted thereon. Retaining means are provided for releasably mounting a plurality of stacked information sheets or cards in the holder to expedite removal thereof for information imprinting purposes. In one embodiment of this invention, a clamping device is pre-applied to an end of the cards prior to their insertion into the holder.

3,820,265
ANIMATED DISPLAY

Ulysses Leonard, 5914 N. 67th St., Milwaukee, Wis. 53218

Filed Nov. 16, 1972, Ser. No. 307,263
Int. Cl. G09f 19/08
U.S. Cl. 40—106.3 **5 Claims**

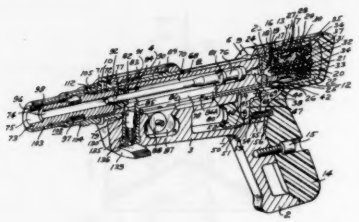


A figure representing Santa Claus in a sleigh is connected to a supporting structure and a line of figures representing Santa's reindeer are each pivotally connected to a generally horizontal arm which projects laterally from the supporting structure. An electric motor is mounted on the supporting structure and is pivotally linked to the nearest reindeer to rock it about its pivotal axis. Each reindeer is pivotally linked to the one behind it so that the rocking movement is transmitted along the line of reindeer to simulate galloping.

3,820,266
CARTRIDGE CASE EJECTOR FOR BOLT GUN

Sven Gunnar Olof Larsson, Huskvarna, Sweden, assignor to Gunnebo Bruks Aktiebolag, Gunnebolbruk, Sweden

Filed Jan. 26, 1973, Ser. No. 326,824
Int. Cl. F41c *15/00*; B25c *1/14*
U.S. Cl. 42—25 2 Claims

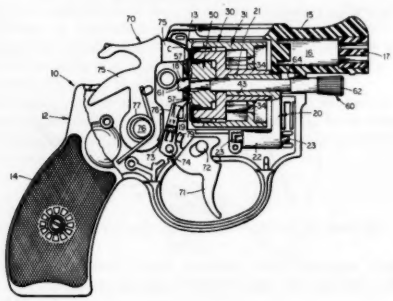


A gun for driving nails, bolts, etc. by the force generated by detonating an explosive cartridge has a firing mechanism with a striker pin for detonating the cartridge by operating the firing mechanism. The gun comprises an axially movable bolt accommodating a movable striker pin which, in turn, mounts a transversely disposed pin for limiting the axial movement of the striker pin and a spring which acts upon the bolt. The outside of the bolt includes an axial groove in which is placed an elongate member, the ends of which are provided with two inwardly directed arms. One arm is placeable into contact with the explosive cartridge at the forward flange thereof when the gun is cocked. This placement of the arm retains the cartridge against the front surface of the bolt. The other arm, due to the shape of the bolt, replaces the pin limiting the movement of the striker pin.

3,820,267
TOY CAP REVOLVER

Robert W. Replogle; Earl D. Clark; Robert A. Goldenetz, all of Bryan, and Eugene E. English, Ney, all of Ohio, assignors to Ohio Art Company, Bryan, Ohio

Filed Apr. 18, 1973, Ser. No. 352,095
Int. Cl. F41c *3/06*
U.S. Cl. 42—58 16 Claims



A toy revolver for detonating cup shaped caps having a hollow rotatable cylinder provided with a plurality of integral circumferentially spaced, axially extending anvil pins disposed closely adjacent its inner surface, and a drum shaped ejector member captively held by the anvil pins for rotation therewith but axially movable relative thereto for pushing the cup shaped caps off the anvil pins. The ejector member together with the inner surface of the cylinder wall also define housings for each anvil pin for individually shielding the caps.

3,820,268
BITE SIGNAL FOR FISHING ROD

Elbert J. Newton, 8912 Candelaria, Albuquerque, N. Mex. 87112

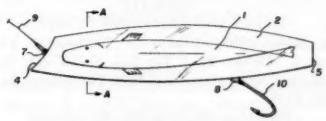
Filed Mar. 29, 1973, Ser. No. 345,830
Int. Cl. A01k *97/12*
U.S. Cl. 43—17 7 Claims

An electric circuit make and break device for use on a bendably resilient pull responsive outer end portion of a fishing rod, said device comprising inward and outward properly oriented current conducting clips. These clips are elongated and substantially U-shaped in plan and have forward and rearward companion adapters adhesively anchored atop selected portions of the rod and have their adjacent lateral end portions coordinated and providing normally open but closable contact elements. One contact element is equipped with a manually regulatable setscrew capable of controlling the sensitivity of the circuit closing step. Visual and audible bite signals, one a light and the other one a buzzer, are electrically wired to the complemental clips for simultaneous operation in a manner to alert the angler so that he can play and land his catch in keeping with the conditions at hand.

3,820,269
FISHING LURE

Albert Thomas Rae, 742 16th St., Courtenay, British Columbia, Canada

Filed May 25, 1973, Ser. No. 364,002
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.05 3 Claims



This invention relates to fishing lures made of preserved and/or dehydrated natural baits embedded in clear plastic, and designed to simulate the action of wounded or stunned live baits swimming on their side. The advantages over the use of natural baits in their normal or live state, and the use of artificial lures, is that by the use of baits preserved in their natural state, and embedded in clear plastic appearance, the shape and size of the foods which game fish feed on are retained. Further, all of the advantages of artificial lures such as durability, availability, the ease of storing and using, and the flexibility of movement or action of an artificial lure are achieved. The method of manufacturing such a fishing lure.

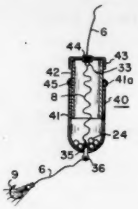
3,820,270
SEMI-BUOYANT SINKER

Robert C. La Force, 514 W. View Dr., Beaver, Pa. 15009

Filed Nov. 21, 1972, Ser. No. 308,413
Int. Cl. A01k *93/00*, *95/00*
U.S. Cl. 43—43.14 7 Claims

A fishing sinker is provided having the properties of heaviness in air and of lightness or of a desired buoyancy in water. The sinker may be used either on an attached auxiliary line or on a fishing line or leader between a pole and the hook or lure.

It basically has a weight that is sufficient for casting the lure a desired distance and a sealed-off fluid or air space that gives it

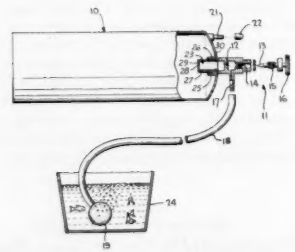


a suitable buoyancy when it strikes the water. It may be constructed for a variation of its buoyancy and for a change in its center of gravity within the water.

3,820,271
FISHING LINE
Leon L. Martuch, Midland, Mich., and Bernard Kreh, Miami, Fla., assignors to Scientific Anglers Inc., Midland, Mich.
Filed Apr. 19, 1972, Ser. No. 245,546
Int. Cl. A01k *91/00*
U.S. Cl. 43—44.98 **10 Claims**

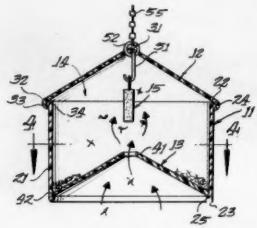
A reversible weight forward line having a weight forward section at each end of the line. Each weight forward section comprises a gradually-sloping forward taper of increasing diameter, a belly section of uniform diameter, and a short abruptly-sloping rear taper.

3,820,272
BAIT TANK AERATION DEVICE
Joseph L. Rowe, 5809 Barberry Ln., Portsmouth, Va. 23701; Leeman S. Meeker, Rt. 2 Box 212, Smithfield, Va. 23430, and Deleon Everette Calamas, 4020 Threechopt Rd., Hampton, Va. 23366
Filed Mar. 30, 1972, Ser. No. 239,621
Int. Cl. A01k *97/04*
U.S. Cl. 43—57 **1 Claim**



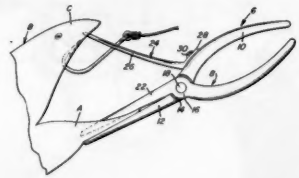
A water filled bait tank is aerated with the use of a compressed air bottle permitting filtered air to be metered into the tank through a porous air stone. Metering is accomplished by a removable valve unit having a threaded needle valve mounted therein. A filter is also mounted in the unit.

3,820,273
FLY AND INSECT TRAP
John Novak, 16 Beverly Blvd., Hobart, Ind. 46342
Filed Sept. 24, 1973, Ser. No. 400,248
Int. Cl. A01m *1/04*
U.S. Cl. 43—113 **8 Claims**



A fly and insect trap having a cylindrical body with a conical cover closing the top of the body and a conical bottom closing the bottom of the body and having an opening through the apex portion of the bottom, the body defining between the interior surfaces of the cover and bottom a trap chamber for trapping the flies and insects therein, the cover adapted to receive poisoned bait or the like suspended from the apex portion thereof, with the entire trap intended to be suspended from the cover by a chain or the like in the desired location. The cover and bottom are detachably attached to the body so that they may be completely separated therefrom for ease of cleaning and the like. Further, rather than using a poisoned bait or the like there is provided an electric light to be suspended interiorly of the cover which serves to attract the flies and insects thereto in the well known manner, the cord of the lamp passing through the cover to be used for suspending the trap in the desired location.

3,820,274
FINGER SAVER PLIERS
Tefel F. Drenzyk, 4 Prospect Pl., Torrington, Conn. 06790
Filed Aug. 2, 1972, Ser. No. 277,260
Int. Cl. A01k *97/00*
U.S. Cl. 43—53.5 **1 Claim**

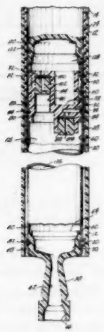


Manually usable fish mouth opening pliers comprising a pair of similar lever units. Each unit embodies a handle having an outer end provided with a long-nosed pincers-type jaw. Both units have median overlapping portions crossed and pivotally connected in a manner that the pincers-type jaws are openable and closable, that is, in clampable and releasable manner. Simple and practical means is mounted on the handle of one unit and is designed and functions to engage, spread and prop the upper jaw of the mouth of the fish open while, at the same time, the lower jaw is grippingly clamped and held open by the jaws of the pliers.

3,820,275
TOY ROCKET MOTOR WITH PRESSURE-RESPONSIVE MEANS ACTIVATED BY PROPELLANT PRESSURE

Charles J. Green, Vashion Island, Wash., assignor to Estes Industries, Inc., Penrose, Colo.

Filed Feb. 4, 1972, Ser. No. 223,452
Int. Cl. A63h *27/06*
U.S. Cl. 46—74 B **13 Claims**



A toy rocket has a motor receptacle designed to receive a rocket motor of the type fueled by a self-pressurizing liquid propellant. The rocket motor during the fueling operation has its nozzle seated in a launcher through which liquid propellant flows into the propellant cavity of the rocket motor. When the propellant cavity of the rocket motor is pressurized, a member in the motor, responsive to propellant pressure in the rocket motor, extends through an aperture in the motor wall and engages a portion of the walls of the motor receptacle. When the pressure responsive member releases the receptacle walls, relative motion is provided between at least a portion of the rocket body and the rocket motor. In one embodiment a second stage portion of the rocket is spring-biased away from a first stage portion of the rocket body. The major section of the rocket motor is fixed to the first stage portion. The pressure responsive member on the rocket motor engages the second stage portion while the propellant maintains pressure to prevent separation of the first and second stages. When the propellant is expended, the pressure responsive member releases the second stage, allowing separation from the first stage. A parachute is then deployed from the second stage to brake the descent of the rocket.

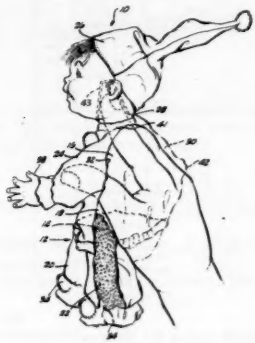
A rocket launcher includes a seal for engaging the nozzle of the rocket motor, a fueling port and a releasable latch means for forcing the rocket nozzle onto the seal of the launcher to prevent loss of propellant.

3,820,276
PARTICULATE-FILLED HAND-PUPPET AND PLAY DOLL

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Dr., Encino, Calif. 91316

Filed Feb. 21, 1973, Ser. No. 334,244
Int. Cl. A63h *3/14*
U.S. Cl. 46—154 **14 Claims**

A soft, formable pellet filled doll which may be played with both as an ordinary doll and as a hand puppet. The doll comprises a flexible casing which includes an upper torso portion, a lower torso portion, and a pair of leg portions. The casing contains a body of shiftable filler such as discrete plastic pellets, which help give form and shape to the doll in various portions, such as sitting. A head and a pair of arms are secured to the upper torso portion. A flexible cover sheet of material is disposed over the back of the upper torso to define an exterior compartment for receiving the hand of the user when the doll is being utilized as a hand puppet. Means connected to the head and arms of the doll may be selectively manipulated by the hand of the user within the compartment to cause desired head and arm movement. Such means may comprise structures defining apertures for receipt of the fingers of the user, or structures which the user may grasp or push to effect such movement. The cover serves to conceal the manipulating means from view so as to not detract from the ordinary doll appearance of the item. To facilitate the multiple usage of this

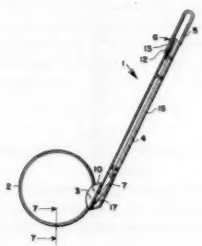


doll, it is constructed and arranged so that the pellets can flow out of the upper torso portion when the doll is being used as a hand puppet, to thereby maintain reasonable proportioning between the upper portion of the body which is then enlarged by the hand of the user, and the remainder of the doll. On the other hand, when the hand is removed from the compartment the pellets may be caused to flow into and occupy the upper torso portion to give the doll a full, three-dimensional life-like appearance and feel. In this connection, the doll may be arranged in an upright sitting position where the legs are virtually emptied of the pellets, and a great majority of the pellets are concentrated within the torso portions.

3,820,277
HOOP ROLLING AND BRAKING DEVICE

Dale H. Beaver, 3102 N.E. 56th Ter., Gladstone, Mo. 64119

Filed June 25, 1973, Ser. No. 373,469
Int. Cl. A63h *11/00*
U.S. Cl. 46—220 **9 Claims**



A hoop rolling and braking device adapted to control speed and direction of travel of a metal hoop includes a hoop guide mounted on a lower end of a guide stick having a handle portion mounted on an upper end thereof and a mechanism with a portion adjacent to the handle portion and operative to selectively move a speed retardent into an out of position in the hoop guide for retarding rotation of the metal hoop.

3,820,278

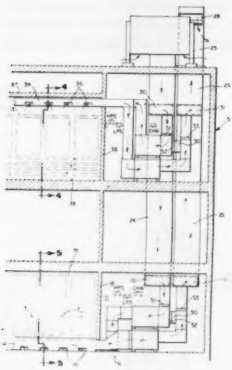
PASTEURIZATION ATMOSPHERE CONTROL SYSTEM

Joseph A. Giasante, 720 Willow St., Pottstown, Pa. 19464

Filed Dec. 12, 1972, Ser. No. 314,449

Int. Cl. A01g 1/04

U.S. Cl. 47—1.1 8 Claims



Pasteurization rooms for the pasteurization of compost in the forced growing of commercial cultivated mushrooms include a fresh air supply system and duct work, supply air fan, return air fan, room supply and return duct systems, by-pass and relief air ducts, filtration equipment, high and low pressure steam systems, cooling systems, automatic and manual temperature and humidity controls, and a compost temperature measurement system for cook-out.

3,820,279

WORM CATCHING DEVICE WITH SAFETY FEATURES

Horst Sieper, Neuss, Germany, assignor to Electronik und Apparatebau GmbH Sintronik, Flensburg-Harrislee, Germany

Filed Nov. 9, 1972, Ser. No. 304,928

Claims priority, application Germany, Nov. 16, 1971, 2156741

Int. Cl. A01g 7/04

U.S. Cl. 47—1.3 5 Claims

Disclosed is a worm catching device comprising electrodes having telescoping, insulating tubes thereon that are displaced to activate switch means upon insertion of the electrode in soil. The device has additional, manually operated switch means and both switch means constitute personal safety features.

3,820,280

GARDEN INSTALLATION

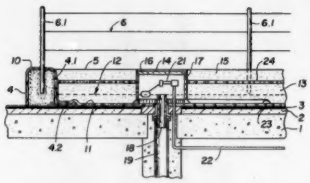
Hans Gilgen, Parkstrasse 23, CH-4102 Binningen, Switzerland

Filed Nov. 28, 1972, Ser. No. 310,024

Claims priority, application Switzerland, Dec. 1, 1971, 17471/71

Int. Cl. A01g 9/00

U.S. Cl. 47—38 3 Claims



A garden installation, especially a roof garden installation, comprises a bed defined by a border of hollow edging elements within which are disposed a separating layer, for example of plastics film, which separates the contents of the bed from an underlying support, for example a roof, a drainage layer, for example of expanded clay or aerated concrete, above the separating layer for regulating the watering of the bed, a filter element above the drainage layer and a layer of soil or other substrate material for receiving plants and/or seeds located above the filter element. The installation may have provision for semi-automatic or fully-automatic watering.

3,820,281

PRE-GERMINATION SEED TREATMENT

E. Ray Bigler, Tempe; Thomas L. Camp, and Perry L. Nelson, both of Phoenix, all of Ariz., assignors to American Bioculture, Inc., Plumsteadville, Pa.

Filed Mar. 2, 1973, Ser. No. 337,394

Int. Cl. A01n 21/02; A01g 7/00

U.S. Cl. 47—58 7 Claims

A method treatment of seeds by soaking in an aqueous medium containing the metabolites produced by green algae is disclosed. The culture is harvested during the early logarithmic phases of growth of the algae but after a cell density of about 1×10^5 cells per milliliter is reached. Rice, corn, and other seeds such as lettuce and barley treated with the invention exhibit more rapid root initiation, faster root establishment and larger quantities of roots per seedling. Increases in shoot weight and length also are observed.

3,820,282

HYDRAULIC DOOR HINGE

Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

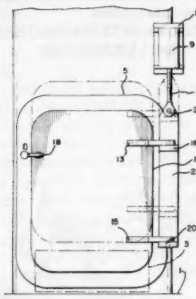
Filed Nov. 24, 1972, Ser. No. 309,125

Int. Cl. E05f 7/02

U.S. Cl. 49—255 3 Claims

The disclosure relates to a door for use in marine environments, the door being rotatable about a support frame on which are mounted hinges secured to the door. The door is raised for rotation of the door by means of sliding the door

hinges along the support frame to clear obstructions in front of the door. The door movement is provided preferably by a

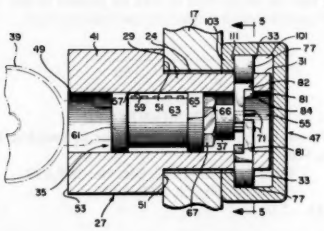


hydraulic cylinder though a manually operated screw or winch or a hydraulic pneumatic or motor driven winch, screw, rack and pinion etc. can be used.

3,820,283
LOCKING SYSTEM AND LOCK THEREFOR

Roger J. Acerra, 1288 Perry, Apt. 21, Des Plaines, Ill. 60016; Patrick J. Manley, 34 Orchard, Bensenville, Ill. 60106, and John W. Shramovich, 3241 W. 55th St., Chicago, Ill. 60603

Filed Sept. 14, 1972, Ser. No. 289,313
Int. Cl. E05b *65/14, 67/36*
U.S. Cl. 49—449 **10 Claims**



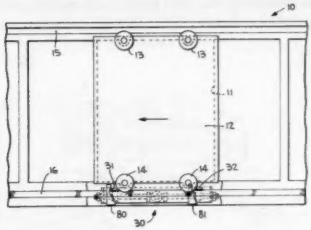
A locking system is provided for locking sliding doors of railroad cars. An aperture is drilled in the car and a portion of a removable, portable lock is inserted into the aperture. A key operated means in the lock may be operated by a key to shift bolt elements into locking position to prevent removal of the lock from the aperture. A protective cap may be placed over the inner end of the lock if the bolt elements are exposed. When the lock is secured to the car, the lock itself or a stop fastened thereto projects into the path of movement for the car door or otherwise prevents the car door from being slid open.

3,820,284
POWER DOOR LOCK

Julius Boughton, 10221 S. Peoria St., Chicago, Ill. 60643

Filed Sept. 18, 1972, Ser. No. 289,785
Int. Cl. E05d *13/04*
U.S. Cl. 49—449 **10 Claims**

A lock particularly adapted for railway cars or the like, is disclosed wherein the actuation is controlled by remote control and unauthorized operation is prevented in a unique manner. The door is mounted for sliding action, and stop means in the form of pins are mounted for projecting movement into the path of travel of the slide means to prevent operation of the door by jamming action. The control means includes a cross bar operated by an air cylinder. Solenoid valve means operates the cylinder and is constructed to main-

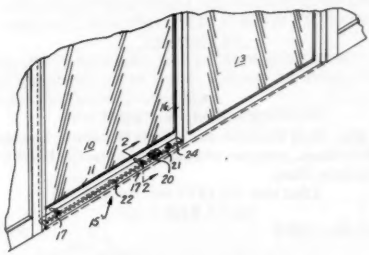


tain the door locked, even in the event of power failure or disconnection. The entire control means is in a sealed or enclosed box to prevent outside tampering.

3,820,285
BLOCKING DEVICE FOR LOCKING SLIDING CLOSURES

George M. Shiffler, and H. H. Baskin, Jr., both of 1275 Cleveland St., Clearwater, Fla. 33515

Filed Dec. 1, 1972, Ser. No. 311,106
Int. Cl. E05d *13/06*
U.S. Cl. 49—450 **6 Claims**



A locking bar for sliding closures having a main portion and a shorter hinged portion is described. Mounted on the main portion are two spring-loaded retractable sliding bolts, which mate with pre-drilled holes in the base of one closure frame member. The locking bar is inserted in the track of the other closure member with the sliding bolts engaging the holes, so as to prevent either closure from being opened from the outside by an intruder. However, the relatively short hinged member may be swung to an upright position by means of a recessed finger pull, thus permitting one sliding closure member to be cracked for ventilation while at the same time preventing ingress through the closure.

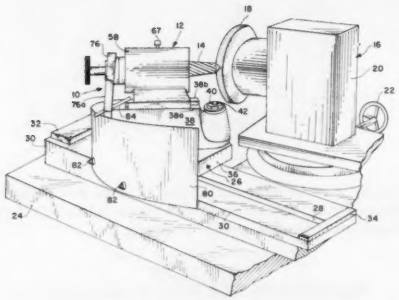
3,820,286
GRINDING ARRANGEMENT FOR BALL NOSE MILLING CUTTERS

Charles F. Burch, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 14, 1972, Ser. No. 289,017
Int. Cl. B24b *3/08*
U.S. Cl. 51—97 R **4 Claims**

A grinding arrangement for spiral fluted ball nose end mills and like tools includes a tool holder for positioning the tool relative to a grinding wheel. The tool is mounted in a spindle within the tool holder for rotation about its centerline and the

tool holder is pivotably mounted for angular movement about an axis which intersects that centerline. A follower arm of a cam follower secured to the spindle cooperates with a specially shaped cam to provide rotation of the tool during the angular movement of the tool holder during the grinding cycle,



by an amount determined by the cam profile. In this way the surface of the cutting edge in contact with the grinding wheel is maintained at the same height on the grinding wheel throughout the angular movement of the tool holder during the grinding cycle.

3,820,287

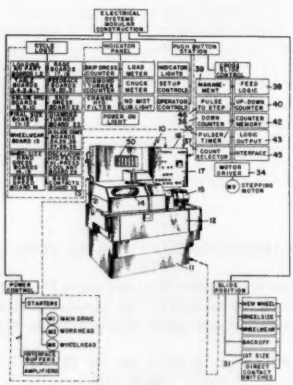
GRINDING MACHINE

John Klar, West Boylston, and Robert H. Lizotte, Leominster, both of Mass., assignors to Cincinnati Milacron-Heald Corp., Worcester, Mass.

Filed Mar. 27, 1972, Ser. No. 238,395

Int. Cl. B24b *51/00*

U.S. Cl. 51—165 R **9 Claims**



Grinding machine with a provision for setting up grinding cycle parameters and then locking them in the selected condition so that they are not accessible to the normal operator.

3,820,288

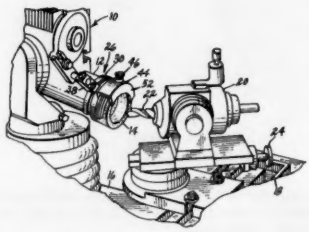
QUICK-CHANGE WHEEL GUARD FOR TOOL AND CUTTER GRINDER

Wendell Irving Evans, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jan. 10, 1973, Ser. No. 322,277

Int. Cl. B24b *55/04*

U.S. Cl. 51—269 **3 Claims**



A quick-change guard for a machine tool supporting a rotating tool, the guard having a sectioned cup-shaped backplate located perpendicular to the axis of and to the rear of the rotating tool, said backplate having a lip on the forward edge of the cupped portion designed to receive the interlocking lip of a series of shields releasably secured to the backplate, each shield encircling a portion of the tool and containing a face plate extending therefrom to enclose a substantial portion of the rotating tool. The backplate is slidably secured to the machine tool in order that it may be placed in the most appropriate position with respect to the rotating tool.

3,820,289

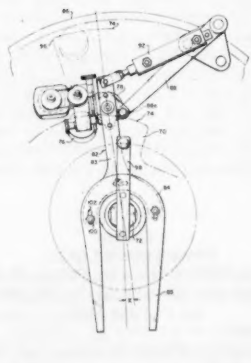
KNIFE SHARPENER

Paul F. Good, Lutherville, Md., assignor to Speedco, Inc., Baltimore, Md.

Filed June 23, 1972, Ser. No. 265,439

Int. Cl. B24b *3/46*

U.S. Cl. 51—248 **9 Claims**



The grinding wheel of a sharpener for an involute cutting blade is held on the blade cutting edge by tiltably mounting the grinding assembly relative to the knife cutting edge.

3,820,290

METHOD FOR THE RAPID CURE OF CONDENSATION POLYMERS AND PRODUCTS RESULTING THEREFROM

Leslie E. Erikson, Holden, Mass., assignor to Norton Company, Worcester, Mass.

Filed Oct. 7, 1970, Ser. No. 78,973
Int. Cl. C08g 51/12
U.S. Cl. 51—298 13 Claims

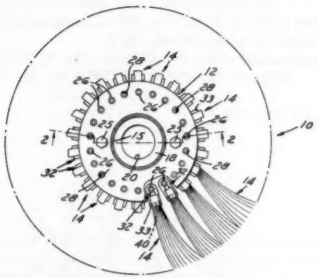
Condensation polymers which generate by-products containing hydroxyl or amine radicals are cured rapidly and essentially free of voids and other defects generally resulting from such usually volatile by-products. This improvement is such cured condensation polymers is facilitated by incorporation therein of specified amounts of a non-cross linked polymeric organic acid anhydride which reacts with the hydroxyl or amine containing condensation by-product and likely with the condensation polymer itself, without any significant deleterious side effects such as plasticization or a reduction in the thermal resistivity of the cured condensation polymer.

3,820,291

REPLACEABLE HINGE TYPE ABRASIVE UNITS OR PACKS FOR CYLINDRICAL HUB STRUCTURES

James A. Belanger, Livonia, Mich., assignor to Belanger, Inc., Northville, Mich.

Continuation of Ser. No. 155,733, June 23, 1971, abandoned.
This application July 5, 1973, Ser. No. 376,812
Int. Cl. B24b 9/02
U.S. Cl. 51—334 25 Claims



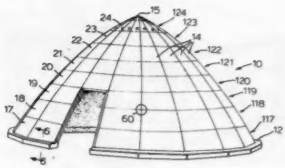
The pack unit comprises a flap-like member of fill material and a mounting member distinct from the flap-like member for mounting the latter on one of the circumferentially spaced mounting pins of a rotary wheel hub structure, with the pack unit extending radially outwardly of the axis of the hub structure. The mounting member is a relatively rigid unitary one prior to association with the flap-like member and is preferably cut in the desired length from an elongated extrusion made, as an example, from an aluminum or a rigid plastic composition. The mounting member provides a single radially inner and axially extending portion formed with an opening of one of several shapes which telescopes axially onto one of the mounting pins. The mounting member includes a pair of integral, radially outer and outwardly extending arm formations on the inner portion and co-extensive therewith in overall length. The radially inner portion of the flap-like member is located between and is secured to the arm formations by staples or other fastening elements which clamp the arm formations against the fill material therebetween. A circumferential series of pack units may be mounted for pivotal movement on the pins of the hub structure and may be readily removable therefrom for replacement upon expected wear by the separation of component parts of the hub structure.

3,820,292

BUILDING STRUCTURE

John R. Fitzpatrick, Islington, Ontario, Canada, assignor to Establissement Rafel, Vaduz, Liechtenstein

Continuation of Ser. No. 84,318, Oct. 27, 1970, abandoned.
This application May 22, 1972, Ser. No. 255,643
Int. Cl. E04b 1/32
U.S. Cl. 52—81 12 Claims



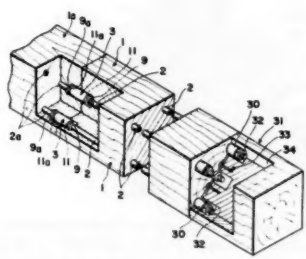
A segmented building structure consisting of a plurality of similar wedge-shaped sectors, all converging upwardly and sloping inwardly to form a building resembling a pyramid. Each sector, however, is so shaped that it bulges outwardly slightly, and each consists of several segmental panels of trapezoidal shape. The outward bulge in each sector is achieved by making the acute angle between the bottom edge and a side edge of each segmental panel slightly greater than the corresponding angle in the segmental panel next above it.

3,820,293

FRAMED STRUCTURAL MEMBER AND BOARD STRUCTURE COMPOSED OF SHORT TIMBERS ASSEMBLED

Fumio Ohe; Yoshio Saito, both of Tokyo, and Naomitsu Megumi, Funabashi, all of Japan, assignors to Tokyo Plywood Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1972, Ser. No. 319,396
Int. Cl. E04b 2/10; E04f 17/02
U.S. Cl. 52—127 6 Claims



This invention relates to a framed structural member for use as pillars, beams girders and the like in buildings, vehicles and the like and also to a board structure for use in floors, walls, partition walls and the like.

3,820,294

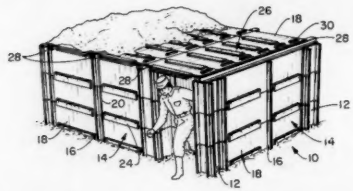
INTERLOCKING MODULES FOR RAPID CONSTRUCTION OF SHELTERS AND BARRIERS

Clarence E. Parker, 6235 Kearney St., Ventura, Calif. 93003

Filed July 23, 1973, Ser. No. 381,468
Int. Cl. E04b 2/18
U.S. Cl. 52—262 10 Claims

This is a modular construction system for rapid assembly and disassembly of shelters and barriers which provides protection from natural or man-made environments. The shelters

are constructed from three types of modules which permit a wide variety of covered structures or walls which may be quickly erected to protect occupants and equipment. The three modules are end panels or spacers which are slotted, side wall or roof panels which have asymmetric slots on either end and a groove along one edge and a rectangular roof beam having vertical hook-like connectors spaced along the outside



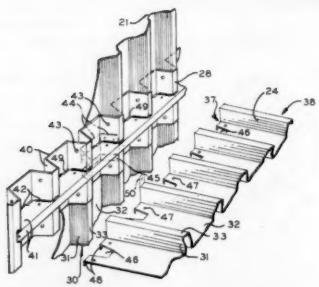
wall of the beam. When the spacers are interlocked with two of the side wall panels, a cavity is formed which can be filled with sand to provide a more rigid and solid shelter. For overhead cover, two or more beams span the walls and the panels interlock with the hook-like connectors along the outside of the beams to form the roof. The panels interlock horizontally by the grooves and overlap at the hook. Sand or sandbags can be piled on the roof to give additional protection.

3,820,295

BUILDING STRUCTURE FORMED OF FLAT CORRUGATED STEEL DECKING

Milo D. Folley, Liverpool, N.Y., assignor to Inco Systems, Inc., Syracuse, N.Y.

Filed Sept. 11, 1972, Ser. No. 288,010
Int. Cl. E04c *2/32, 3/30*
U.S. Cl. 52—270 **2 Claims**



A building has sidewalls, roof and at least one floor formed of preformed panels of flat corrugated steel decking, the sidewall and roof panels providing, if desired, both outer skin and load bearing members. Where the roof panels meet the sidewalls at the eaves, and where the floor ends meet the end walls reinforcing strips are provided, each strip has a corrugated portion nesting with and secured to the wall and another portion secured to the floor or roof, the two portions being rigidly secured together, as by welding. The portion secured to the roof or floor is preferably formed to nest therewith. A ridge strip nesting with the roof panels is also preformed with two portions secured together at the desired ridge angle. Partitions are also formed of the same type of panels and footing panels of the same corrugated material nest with and are secured to the wall panels, the footing panels terminating in transversely extending corrugated pads adapted to be sunk in concrete or like material.

3,820,296

PANEL AND TRIM ASSEMBLY

Jack E. Bebinger, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 16, 1973, Ser. No. 324,052
Int. Cl. E04b *2/18*
U.S. Cl. 52—614 **6 Claims**

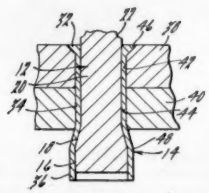
A combination panel and peripheral trim assembly is shown that permits a panel of two distinct thicknesses to be snuggly accepted within the channel defined by the trim. The panel is bounded by an integral peripheral area offset from the general plane of the panel. The trim for snuggly engaging the edge of the panel defines generally a sidewardly opening U shape, thereby providing a channel which receives the offset area, with one leg of the U having a length less than the width of the offset area and the opposing leg of the U having a length extending at least beyond the offset area. The distance between the termination point of the longer leg and an extension of the opposing shorter leg to subadjacent that point defining the effective opening into the U-shape and being generally the sum of the thickness of the panel and the height of the offset from the general plane of the panel.

3,820,297

INTERFERENCE FIT BLIND FASTENER

Ramon L. Hurd, Royal Oak, Mich., assignor to Huck Manufacturing Company, Detroit, Mich.

Continuation of Ser. No. 104,053, Jan. 5, 1971, abandoned.
This application Nov. 10, 1972, Ser. No. 305,459
Int. Cl. F16b *13/06*
U.S. Cl. 52—758 F **20 Claims**



A blind fastener for securing a plurality of workpieces together and being located in a pair of aligned holes in the workpieces with the fastener providing a preselected interference with the holes in the workpieces.

3,820,298

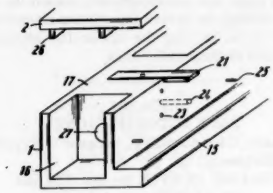
MANUFACTURE OF FRAMES

Bernhard Kirsch, Biewere Str. 193, 55 Trier-Biewer, Germany

Filed July 3, 1972, Ser. No. 268,880
Int. Cl. G09f *1/12*
U.S. Cl. 52—475 **2 Claims**

A frame especially suitable for panes of glass is a hollow channel which is reinforced, either by a rib projecting from the channel web a distance less than half of the height of the channel walls or by a plurality of spaced transverse partitions connecting the sidewalls and forming cavities. Bores through the partitions provided an interior passage for a continuous

reinforcing strip. Bores through the perimetrically inner sidewall receive clamps or setscrews adjustable from the cavity and engageable with the glass pane. A cover having resilient strips snap-engageable in the cavities closes the hollow channel. The frame may be made of straight channel sections connected at abutting mitered corners by a bent or curved hollow member spanning the corner joint. Hardened adhesive embeds the connecting member in the channel.



3,820,299

KIT FOR ASSEMBLING FOR EXAMPLE A PIECE OF FURNITURE, A PARTITION OR TOYS FROM PANELS AND STRIPS

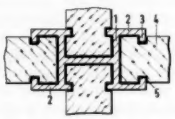
Johannes Maria Verholt, Ulft, Netherlands, assignor to N.V. Meubelfabriek "Deco", Varsseveld, Netherlands

Filed Mar. 8, 1972, Ser. No. 232,708

Claims priority, application Netherlands, Mar. 18, 1971, 7103640

Int. Cl. F16b *5/06*

U.S. Cl. 52—753 C **7 Claims**



A kit for assembling for example a piece of furniture from panels and strips each, said strips forming at least two connected rectangular cross-sectional tube portions, each having main flanges, side flanges and a for the greater part open side, and the panel edges are so formed that they can engage with the strips. The existing part of the open sides consists of two facing hook flanges, one long side of one tube portion is located in the median plane of the long side of the other tube portion and the length of the side flanges in cross-section does not exceed half the length of the main flanges.

3,820,300

METHOD OF AND MACHINE FOR PRODUCING STERILE PACKAGES

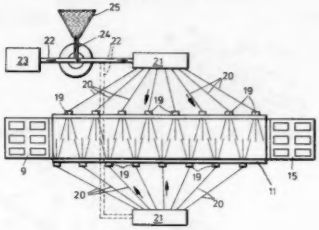
Gunter Reinecke, Wuppertal, and Dietrich Linke, Lintorf, both of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed Apr. 28, 1972, Ser. No. 248,730

Int. Cl. B65b *43/00*

U.S. Cl. 53—29 **25 Claims**

A machine or apparatus and method for producing a plurality of sterile liquid or semi-liquid filled packages from a supply of synthetic plastic film web. The apparatus includes a supporting roll for a supply of web, a sterilization bath for sterilizing the web, and successively arranged heating, forming, filling, closing and cutting stations for carrying out the respective operations of heating the web, forming containers in the web, filling the containers, closing the containers, and cutting the containers from the web. A sterile tunnel encloses that portion of the machine between the forming and closing stations. Spray nozzles are arranged throughout the inside of said tunnel for spraying an excess pressure of sterile air during operation of the machine. A liquid disinfectant supply is arranged in communication with a feed pipe for the sterile air such that the disinfectant is sucked by ventura effect into the feed pipe and intermixed with the sterile air prior to being atomized and sprayed by the nozzles. Prior to starting of the package forming operations, the liquid disinfectant supply is used for disinfecting the inside of the tunnel. Once the disinfectant is used up, the sterile air supply continues to supply an excess pressure of pure sterile air to the tunnel during normal operation of the machine.



3,820,301

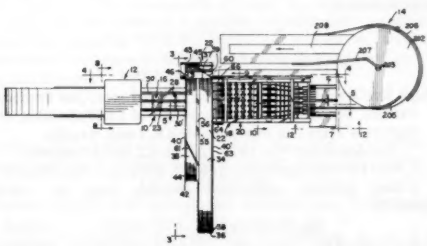
EGG HANDLING APPARATUS

Charles H. Willsey, Maple Hill, Kans., assignor to Seymour Foods, Inc., Topeka, Kans.

Filed Apr. 30, 1973, Ser. No. 355,310

Int. Cl. B65b *57/10, 35/44*

U.S. Cl. 53—62 **29 Claims**

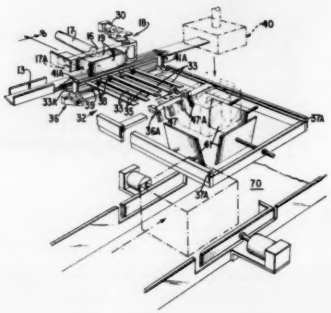


An apparatus for packing eggs in pocketed containers, such as, cartons or filler flats, which apparatus includes a lower conveyor with a generally horizontal run disposed so as to receive in upwardly opening position successive empty containers, a dispensing mechanism at one end of the conveyor for supplying successive containers and an overhead mechanism to which eggs are fed from a cross conveyor on which the eggs are in random arrangement and from which the eggs are diverted onto a roller or spool conveyor so as to fill rows of pockets on the conveyor, the roller conveyor advancing the eggs to an orientor where the eggs are arranged with their long axes vertical and the small ends down on an associated cross bar conveyor, the latter conveyor having cooperating lane forming members which guide the eggs in properly spaced row arrangement as they are advanced to a container filling position at the end of the cross bar conveyor where mechanism guides the successive rows of eggs down over the end of the conveyor and into the pockets of a container which has been advanced on the lower conveyor to the filling position.

3,820,302
CARTON CASING APPARATUS

Robert J. Doran, Danbury; Robert W. Grall, Bethlehem, and Joseph F. Pane, Danbury, all of Conn., assignors to Windor, Incorporated, Danbury, Conn.

Filed Apr. 5, 1973, Ser. No. 348,330
Int. Cl. B65b *5/08, 35/36, 35/56*
U.S. Cl. 53—159 **15 Claims**

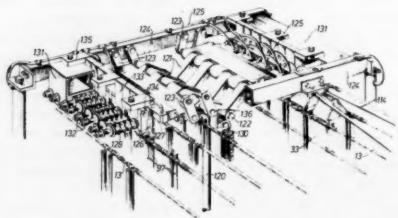


A conveyor conveys a row of pairs of cartons to a casing apparatus which marshals the cartons into a tier for positioning into a case. A pivoting mechanism pivots the first pair of cartons at right angles to the conveyor onto a horizontal carrier and a pusher pushes subsequent pairs of cartons transversely from the row onto the conveyor. The pivoting mechanism resiliently retains a pair of cartons during the pivoting operation. The tier of cartons is positioned below a gripping head having clamps actuated simultaneously to grip the cartons upon downward movement of the gripping head. The gripping head has one pair of clamps at right angles to the remaining clamps and a linkage is provided to actuate all of the clamps simultaneously.

3,820,303
PACKAGING MACHINE

Kjell Halvard Martensson; Bjorn H:Son Linde; Jan Frederik Palsson, and Sven Torsten Jerre, all of Lund, Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Division of Ser. No. 227,812, Feb. 22, 1972, Pat. No. 3,785,113. This application July 19, 1972, Ser. No. 273,334
Claims priority, application Sweden, Mar. 25, 1971, 3864/71
Int. Cl. B65b *3/02, 7/06, 51/32*
U.S. Cl. 53—186 **2 Claims**

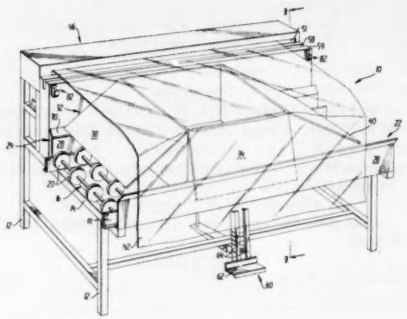


A packaging machine by which package blanks are erected into packages having top closure elements, said packages being arranged in two parallel lines and filled with a liquid and are then passed in the parallel lines through a sealing station having one pair of sealing jaws for each line, the outer jaw of each pair being substantially fixed and the inner jaw of each pair being movable toward the associated fixed jaw by a vertically movable horizontal shaft connected by link arms to the movable inner jaws whereby when the shaft is raised or lowered each inner jaw moves laterally toward the associated fixed jaw for sealing the heated top closure elements said jaws being cooled so as to cool the sealed top elements of the packages in each of the parallel lines.

3,820,304
PACKAGING MACHINE

Herbert S. Bailey, Glen Allen, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jan. 18, 1973, Ser. No. 324,564
Int. Cl. B65b *11/02, 67/00*
U.S. Cl. 53—201 **8 Claims**



An apparatus for packaging food products or the like which is readily convertible from a machine which packages directly into cartons, to a sheeter-wrapper unit or vice versa. When used as a carton packaging machine, longitudinally extending guide means permit an operator standing in front of a flat bed of the machine to stand immediately adjacent the cartons which are moved along a conveyor over the flat bed. In this position, the operator may grasp the free end of a plastic sheet, withdraw a desired amount from a roll supply and drape it over an open-topped carton. The food product is placed into the carton, drawing the film down into the carton at the same time. The operator then severs the sheet with a hot wire which he actuates with a foot pedal and completes wrapping the food product. The machine is readily converted into a sheeter-wrapper unit by placing a substantially flat work surface above the conveyor but beneath the payout of the plastic sheet. In a preferred form, the flat work surface is provided by a table having two legs to support a front portion thereof and a pair of clip members to support a rear portion thereof.

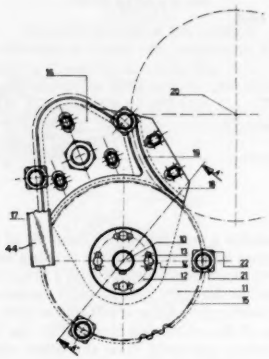
3,820,305
CAP SUPPLY MECHANISM FOR A ROTATING BOTTLE CLOSING DEVICE

Leonardus Petrus Van Der Meer, Roelofarendsveen, Netherlands, assignor to N.V. Leidsche Apparatenfabriek, Leiden, Netherlands

Filed Oct. 3, 1972, Ser. No. 294,567
Int. Cl. B65b *7/28*; **B67b** *3/06, 3/062*
U.S. Cl. 53—308 **16 Claims**

A cap supply mechanism for a rotating bottle closing device provided with a supply trough for supplying caps in a predetermined position and means for picking up the caps one by one from the supply trough and conveying the caps to a position below closing chucks of the rotating bottle closing device. The means for picking up the caps from the supply trough is a

horizontally arranged endless conveying means, a part of which passes below the closing chucks but above the path of the tops of the necks of bottles carried by the mechanism so that the part follows the path of the closing chucks at the same



speed, and means, at distances equal to the distances of the closing chucks. The endless conveying means has cap conveying disks mounted thereto in a manner to pick up caps, with their open ends down, from the supply trough.

3,820,306

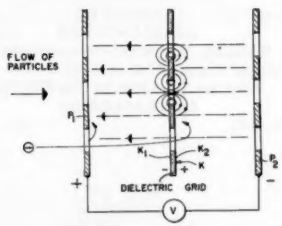
ELECTROSTATIC PRECIPITATOR EMPLOYING DIELECTRIC GRIDS

James Henry Vincent, Plainfield, N.J., assignor to American Standard, Inc., New York, N.Y.

Continuation-in-part of Ser. Nos. 869,195, Oct. 24, 1969, Pat. No. 3,616,606, and Ser. No. 65,843, Aug. 21, 1970, each is a continuation-in-part of Ser. No. 804,050, Feb. 25, 1969, abandoned. This application Nov. 2, 1971, Ser. No. 194,983

Int. Cl. B03c *3/04*

U.S. Cl. 55—123 **19 Claims**



Covers an electrical precipitator composed of a plurality of similar apertured plates, called "grids", which are vertically arranged so that particles of matter may be transmitted through the apertures of any or all of the grids. The grids may comprise two or more apertured metallic plates, between any two of which there may be one or more dielectric plates which are also apertures so that the particles of matter may also be transmitted therethrough. Such dielectric plates will receive induced potentials and hence engage in the process of precipitation of such particles. If a single apertured dielectric plate is arranged between two apertured metallic plates, it may be equally spaced from and between the two metallic plates. If two apertured dielectric plates are positioned between two apertured metallic plates, the two dielectric plates may be spaced from each other by a distance which is about equal to the spacing of either of the dielectric plates from the respective adjacent metallic plates.

3,820,307

APPARATUS FOR SCRUBBING WASTE GASES

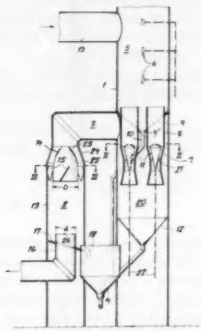
Gerhard Hausberg, Graf-Bernadottestrasse 48, 43, Essen-Bredeney, and Karl-Rudolf Hegemann, Am. krausen. Bauchen. 1-3, 43, Essen-Bergerhausen, both of Germany

Filed Oct. 12, 1971, Ser. No. 188,558

Claims priority, application Germany, Oct. 10, 1970, 2049901

Int. Cl. B01d *47/06, 47/10*

U.S. Cl. 55—226 **10 Claims**



Waste gases from a Bessemer converter or the like are conducted downwardly through a wash tower containing several spray heads above a parallel array of constricted nozzles forming annular gaps to accelerate the flow of the wetted gases from an upper to a lower compartment. Just below a partition separating the two compartments, a lateral outlet for the expanding gases lies above the level of the lower nozzle ends whereby the gas flow undergoes a change of direction with resulting separation of entrained droplets from the gas. The flow then passes downwardly through an adjoining water separator in the form of a vertical cylinder with a central deflector separated from the peripheral wall by an annular clearance containing vanes for imparting swirling motion to the gas stream.

3,820,308

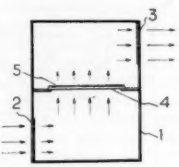
STERILIZING AIR FILTER WITH FORMATION OF WET, OBEAGINOUS AND DURABLE STERILIZING COATING OF FILTER BODY

Michiko Onuki, 688 Nishiya-cho, Hodogaya-ku, Yokohama, Japan

Filed Nov. 10, 1971, Ser. No. 197,723

Int. Cl. B01d *31/00*

U.S. Cl. 55—279 **4 Claims**

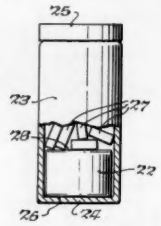


A sterilizing air filter is disclosed wherein the filter elements are coated with a wet, oleaginous durable sterilizing material. The coating material comprises a mixture of amphoteric sterilizing agents and quaternary ammonium salt sterilizing agents incorporated in a paraffin hydrocarbon carrier system.

3,820,309
ADSORBENT CARTRIDGE

John S. Cullen, Buffalo, and Paul W. Huber, Depew, both of N.Y., assignors to Multiform Desiccant Products, Inc., Buffalo, N.Y.

Filed Oct. 16, 1972, Ser. No. 297,667
Int. Cl. B01d 53/04
U.S. Cl. 55—387 2 Claims

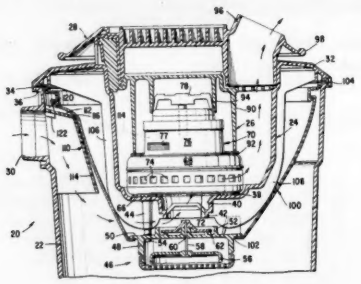


An adsorbent cartridge, containing an adsorbent which may also be a desiccant, for insertion into a container comprising a permeable casing having a longitudinal axis and a cylindrical side wall and substantially planar opposed end walls extending substantially perpendicularly to said side wall, and adsorbent material in said casing. A combination of a container and an adsorbent cartridge with said container having a substantially cylindrical side wall and a bottom wall, and an adsorbent cartridge in said container, said adsorbent cartridge having a substantially planar bottom wall for resting on said bottom wall of said container and also having a substantially cylindrical side wall for positioning throughout its extent in close proximity to the side wall of said container, and a top wall on said adsorbent cartridge for acting as a shelf to support the contents of said container.

3,820,310
VACUUM CLEANER INLET BAFFLE

Charles T. Fromknecht, Anderson, and John C. Davis, Greenwood, both of S.C., assignors to The Singer Company, New York, N.Y.

Filed Jan. 29, 1973, Ser. No. 327,385
Int. Cl. B01d 45/12
U.S. Cl. 55—447 8 Claims

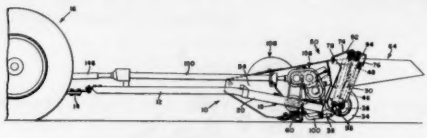


A wet/dry utility vacuum cleaner including a dirt receptacle having an inlet aperture. A baffle is mounted behind the inlet within the receptacle to divert the incoming dirt and/or liquid ladden air tangentially downwardly. The construction of the baffle is such that it may flex or yield to allow trapped dirt to dislodge upon emptying the receptacle. One embodiment of the baffle is a thin sheet of polethylene film. A second embodiment is a rigid member having a hinged flap.

3,820,311
HARVESTING MACHINE DRIVE MEANS

Bobby Gene Sawyer, and Robert Charles Francis, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed June 26, 1972, Ser. No. 266,210
Int. Cl. A01d 49/00
U.S. Cl. 56—14.4 15 Claims

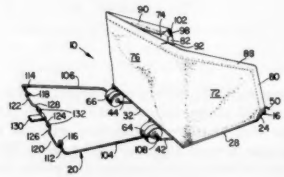


Drive means for a crop harvesting machine of the mower-conditioner type having a transverse mowing apparatus including a drive mechanism therefor with a drive input sheave on one side of the machine, and a pair of cooperating conditioning rolls having drive input shafts on the same side of the machine, one of the rolls being mounted on the machine for movement toward and away from the other roll, the drive means including a drive transmission housing mounted on the side of the machine for vertical pivotal adjustment, the drive housing having an input shaft adapted for driving connection to a power source, a drive output sheave spaced vertically from the drive input sheave of the mowing apparatus drive mechanism, and a pair of drive output shafts generally aligned with the drive input shafts of the conditioning rolls. An endless belt drivingly connects the input sheave of the mowing apparatus drive mechanism and the output sheave of the drive housing, the tension in the belt being variable in response to vertical pivotal adjustment of the drive housing, and a pair of telescoping, universally connected drive shafts drivingly connect the drive housing output shafts with the conditioner roll input shafts, the latter connections accommodating misalignment of the shafts which results from vertical adjustment of the drive housing to tension the mowing apparatus drive belt and movement of the upper roll relative to the lower roll.

3,820,312
GRASS CATCHER

Donald E. Robinson, Marysville, Ohio, assignor to The O.M. Scott & Sons Company, Marysville, Ohio

Filed Nov. 24, 1969, Ser. No. 879,181
Int. Cl. A01d 35/22
U.S. Cl. 56—202 17 Claims



A catcher for grass discharged from a reel mower. It has a flat bottom and a bent wire frame secured under the bottom with front hooks for coupling to the mower and portions rotatably mounting rollers adjacent the rear edge. It has no support devices within the space defined by side and rear walls. The side and rear walls of the catcher are made from a light weight, flexible, woven material with attached top edge and front edge braces formed from separate U-shaped wire rods articulated to collapse when not in use. A specially

shaped rear wire rod bail pivotally mounted adjacent the bottom rear edge of the catcher provides a quick release wall support and latch, cooperating with the top edge wire rod which is enclosed within the top edge binding on the rear wall.

3,820,313

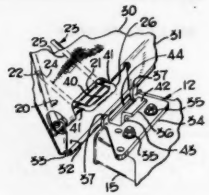
GRASS CATCHER ASSEMBLY

Ralph L. Hoffmann, St. Louis, Mo., assignor to The Perfection Manufacturing Company, St. Louis, Mo.

Filed Oct. 24, 1972, Ser. No. 299,843

Int. Cl. A01d *53/06*

U.S. Cl. 56—202 **2 Claims**



The grass catcher assembly includes an adaptor plate attached to the lawn mower housing above the discharge orifice, the plate having a base portion and an inwardly formed lip overhanging the base portion to provide a hook. The catcher bag frame includes a rigid, projecting loop engageable with the hook to support said catcher bag frame. The loop is attached to the outwardly extending, bag supporting portion of the frame so as to provide spaced points of support transferring the weight of the catcher bag to the lawn mower housing. The adaptor plate includes spaced side abutment portions cooperating with the loop to preclude sideways movement between the loop and the adaptor plate.

3,820,314

HAY-MAKING MACHINE

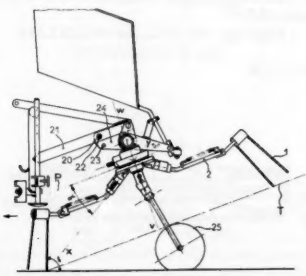
Walter Reber, 50 Avenue du Marecho Foch, Saverne (Bos-Rhin), France

Filed June 9, 1972, Ser. No. 261,328

Claims priority, application France, Aug. 3, 1971, 71.29471; Nov. 23, 1971, 71.43368

Int. Cl. A01d *79/00*

U.S. Cl. 56—370 **8 Claims**



The disclosure is of a hay-making machine for tedding or turning and windrowing or swathing, comprising at least two spinners or rotors upon which the working tools or tires occupy a position closer to a perpendicular position to the ground than to a position parallel with the ground, when they are close to the ground, at the front, for tedding, characterised in that for windrowing the working tools are transposed by means of their carrier arms into a position in which they are more inclined relative to the ground than in their position for tedding and are directed in the direction contrary to the direction of rotation of their respective spinners, and that, by this transposition, the trajectories described by the working tools are reduced.

3,820,315

PNEUMATIC APPARATUS FOR MOUNTING AND THREADING PORTABLE MANUALLY OPERATED YARN KNOTTER MECHANISMS ON YARN PROCESSING MACHINES

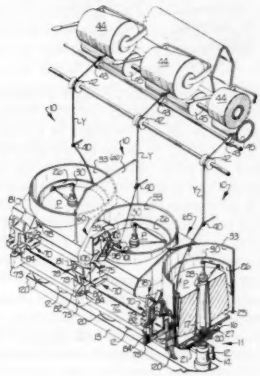
Gustav Franzen, Dusseldorf, and Helmut Veltges, Krefeld, both of Germany, assignors to Palitex Project Company GmbH

Filed July 5, 1973, Ser. No. 376,683

Claims priority, application Germany, July 12, 1972, 2234096

Int. Cl. D01h *15/00*

U.S. Cl. 57—34 R **15 Claims**

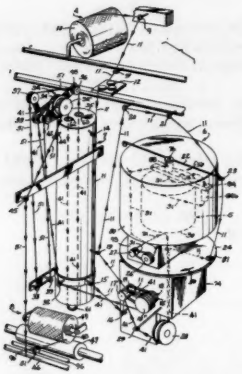


The combination, of a textile yarn processing machine, such as a twister, spinning frame or the like, having a plurality of spindle assemblies positioned in side-by-side relationship for the processing of yarn, and manually operated, portable yarn knotter mechanism for knotting together two ends of broken or otherwise separated yarn at selective spindle locations, having the following improvements. Holders mounted stationary on the yarn processing machine in front of each spindle assembly and including mechanisms for receiving and mounting the yarn knotter mechanism at the desired locations in front of selected spindle assemblies eliminating the necessity of the operator holding the portable yarn knotter mechanism. Pneumatic suction devices are provided which form a part of the yarn knotter mechanism and the yarn holder mechanism for cooperating with each other when the knotter mechanism is inserted into a respective one of the holder mechanisms for pulling and threading the separated yarn ends into and through the knotter mechanism for a knotting operation eliminating the necessity of a manual threading operation. The holder mechanisms preferably include actuators for actuating control mechanisms in response to mounting of the yarn knotting mechanism for stopping and starting operation of the respective spindle assemblies and for stopping and starting operation of pneumatic spindle assembly threading mechanisms which cooperate with the pneumatic suction means of the knotter mechanism.

3,820,316
METHOD AND APPARATUS FOR TWIST PLIED YARN AND PRODUCT THEREOF

Robert J. Clarkson, Winnsboro, S.C., assignor to Uniroyal, Inc., New York, N.Y.

Filed May 25, 1973, Ser. No. 363,986
Int. Cl. D02g 1/00
U.S. Cl. 57—34 HS 15 Claims

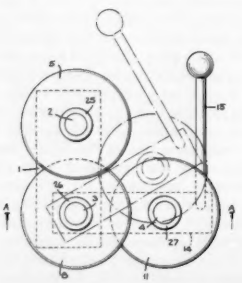


A pretwist memory-free, plied, bulked, continuous filament yarn and a method and apparatus for producing the same in one continuous operation are disclosed. In the method, a first single end of yarn having no more than a producer's twist is ballooned about and plied with a like second single end of yarn while both are under tension and advancing at a common linear speed. A somewhat higher tension is utilized during the plying operation to maintain a stable balloon. The plied yarn is then subjected to heat while the tension is relaxed, followed by a cooling and drying stage, to enable the yarn to be twist-set in a bulked condition, with the component single ends substantially free of any twist memory. This abstract is not to be taken either as a complete exposition or as a limitation of the present invention, however, the full nature and extent of the invention being discernible only by reference to and from the entire disclosure.

3,820,317
FRICTION FALSE-TWIST DEVICE

Josef Raschle, Buetschwill, Switzerland, assignor to Heberlien & Co. AG, Gall, Switzerland

Filed Aug. 30, 1973, Ser. No. 392,945
Int. Cl. D02g 1/04; D01h 7/92
U.S. Cl. 57—77.4 19 Claims

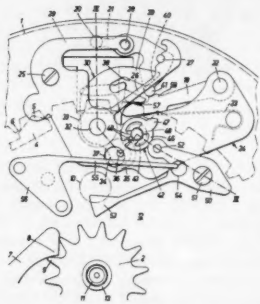


A plurality of discs spaced from one another overlap similar spaced discs to form a tortuous path for advancing yarn to be false twisted. The disc rims are formed with yarn contact tracks inclined at an angle of at least 10° to the disc surfaces, the division of the tracks being from 0.05 to 1 times the disc thickness and the disc rims having an arch or vault radius of between 0.5 and 5 times the disc thickness.

3,820,318
DAY-DATE CORRECTING DEVICE

Josef Fluck, and Roland Zaugg, both of Grenchen, Switzerland, assignors to A. Schild S.A., Canton of Soleure, Switzerland

Division of Ser. No. 172,464, Aug. 17, 1971, Pat. No. 3,735,581. This application Nov. 2, 1972, Ser. No. 303,047
Claims priority, application Switzerland, Nov. 9, 1972, 12400/72
Int. Cl. G04b 19/24
U.S. Cl. 58—58 4 Claims

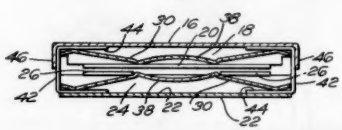


The movement comprises a calendar correcting device independent of the mechanism automatically driving the calendar indicators. This device is controlled by the winding and hand setting stem having a third axial position for the calendar correction and it comprises a pinion driven by the stem when the latter is rotated in correcting position. The pinion carries a correcting member driving the calendar indicators. A frictional coupling provided between the pinion and the correcting member however permits the latter to stay at rest when the mechanism automatically driving the calendar indicators just engages the same.

3,820,319
EXPANSIBLE BRACELET CONSTRUCTION

Katsuhiko Abe, Tokyo, Japan, assignor to Brite Industries Inc., Providence, R.I.

Filed Apr. 10, 1972, Ser. No. 242,314
Int. Cl. F16g 13/24
U.S. Cl. 59—79 R 1 Claim



An expansible bracelet construction is disclosed of the type commonly used for wrist watches and the like comprising top and bottom rows of overlapping staggered links.

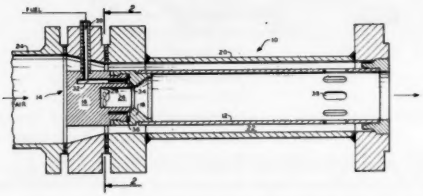
A leaf spring is provided in each link of at least one of the rows of links. The improvement comprises an opening in a wall of the link, and projecting means on the spring snugly

received within the opening for properly positioning and maintaining the spring with respect to its link, so as to prevent undesirable longitudinal shifting of the spring within its link.

3,820,320
COMBUSTION METHOD WITH CONTROLLED FUEL MIXING

Robert M. Schirmer, and Ellsworth H. Fromm, both of Bartlesville, Okla., assignors to Phillips Petroleum, Bartlesville, Okla.

Filed Dec. 15, 1971, Ser. No. 208,137
Int. Cl. F02c 7/36
U.S. Cl. 60—39.06 **5 Claims**

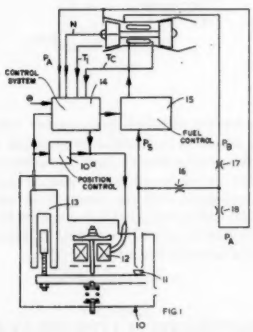


New combustors, and methods of operating same, which produce lower emissions, particularly lower emissions of nitrogen oxides.

3,820,321
ACCELERATION CONTROL FOR GAS TURBINE ENGINE

Robert Graham Burrage, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Apr. 17, 1972, Ser. No. 244,797
Claims priority, application Great Britain, Apr. 21, 1971, 10382/71
Int. Cl. F02c 9/08
U.S. Cl. 60—39.28 R **17 Claims**

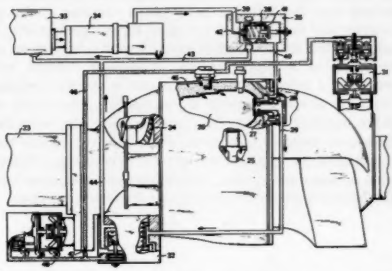


An apparatus for controlling the acceleration of a gas turbine engine has a valve responsive to an electrical control signal to provide a servo pressure signal. The said electrical control signal is derived from engine operating conditions and there is also provided a control circuit responsive to these conditions to generate a further control signal corresponding to the calculated upper limit of acceptable fuel flow to the engine. The control circuit includes a discriminator whereby the signal representing the lower fuel flow is passed to the valve.

3,820,322
DEVICES FOR THE REGULATION OF A GAS-TURBINE TURBO-MACHINE OF LOW POWER

Gaston Bayard, 6 Place Wilson, Toulouse, France

Division of Ser. No. 50,377, June 29, 1970. This application Nov. 7, 1972, Ser. No. 304,315
Int. Cl. F02c 9/04
U.S. Cl. 60—39.28 T **1 Claim**

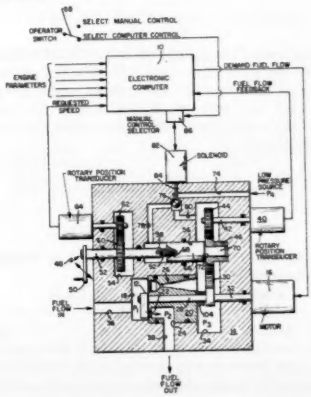


A method of and devices for the regulation of a turbo-machine comprising a compressor and a gas turbine of low power, into the combustion chamber of which is injected a pre-determined flow-rate of fuel, said method consisting of controlling the real flow-rate of injected fuel in dependence on an image of the absolute output pressure of said compressor, in such manner that the corresponding servo-control curve, for which the flow-rates of fuel are plotted in ordinates and the absolute pressures in abscissae, is located above the consumption curve of the turbo-machine corresponding to different stable conditions of operation. The image of the compressor output pressure is obtained by modulating said output pressure as a function of the speed of rotation of at least one rotating assembly of the turbo-machine, so as to reduce this pressure to a greater or less extent in order to obtain and maintain a stable point of operation corresponding to a pre-selected speed.

3,820,323
COMPUTER TO MANUAL CHANGEOVER SYSTEM

Dennis G. A. Burnell, Winsted, and George W. Jahrstorfer, South Windsor, both of Conn., assignors to Chandler Evans Inc., West Hartford, Conn.

Filed Apr. 9, 1973, Ser. No. 349,206
Int. Cl. F02c 9/08
U.S. Cl. 60—39.28 R **6 Claims**



A fuel control incorporating an electronic computer has a system which automatically transfers control of a metering

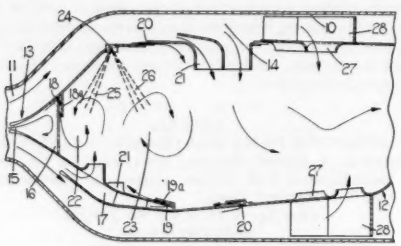
valve from the computer to a manually operated lever member in the event of a computer failure. The system inlcudes a piston member having a cam surface thereupon which is rotatable and movable in a longitudinal direction. The piston member is connected to the metering valve such that the rotation of the piston member produces a positioning of the metering valve. The lever member, which has a cam follower thereupon, is adapted to coact with the cam surface on the piston member such that engagement between the cam surface and the follower produces a rotation of the piston member and hence a positioning of the metering valve. Upon failure of the electronic computer, power supply or an operator's use of a toggle switch, a manual control selector generates a selection signal to a piston member positioning structure which occasions a longitudinal movement of the piston member towards the lever member. The movement of the piston member toward the lever member causes the fuel flow to increase as a function of time, decrease as a function of time, or remain the same, depending upon the initial relationship between the lever member and the piston member.

3,820,324

FLAME TUBES FOR GAS TURBINE ENGINES

William Grindley, Burnley; George Edward Bunn, Clitheroe; Alan Ormerod, Oswaldtwistle, and Alwin Harrison, Burnley, all of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 5, 1971, Ser. No. 196,160
Int. Cl. F02c *3/24*
U.S. Cl. 60—39.74 R **9 Claims**



A flame tube for a gas turbine engine includes a combustion chamber having generally oppositely directed air openings which generate upstream and downstream vortex zones in the chamber. Twin fuel sprayers supply fuel to the respective zones, whereby combustion conditions within each zone are separately maintained.

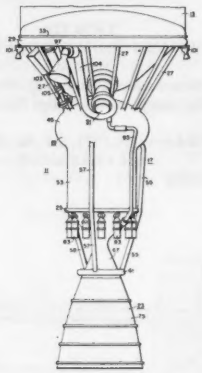
3,820,325

SPACE VEHICLE

Walter G. Roman, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 5, 1970, Ser. No. 7,421
Int. Cl. G21d
U.S. Cl. 60—203 **6 Claims**

A space vehicle is disclosed in which the payload and propellant tank are driven by nuclear rocket engine having a nuclear reactor for heating the hydrogen propellant fluid. The tank contains the liquid hydrogen propellant fluid which is supplied to the reactor through flexible struts by means of a turbopump. Vector control of the vehicle is effected by angular displacement of the engine with respect to the payload and tank about the center of mass of the engine. The engine is



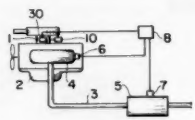
pivoted by deflecting the flexible struts. The rocket engine is of substantially less length than prior-art engines where the angular displacement is effected with the aid of a gimbal ring.

3,820,326

OVERHEAT PROTECTION FOR AFTERBURNER SYSTEM

Tokuta Inoue; Hiroshi Sawada; Hidemi Ohnaka, and Takao Ohshiro, all of Susuono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 13, 1973, Ser. No. 350,762
Claims priority, application Japan, May 1, 1972, 47-42578
Int. Cl. F02b *75/10*
U.S. Cl. 60—277 **6 Claims**



In an afterburner installed in an engine exhaust system, a temperature sensor is positioned to establish when the temperature in the afterburner exceeds a predetermined value so that the engine intake system can be placed in communication with the atmosphere and the connection between the accelerator pedal and the throttle valve can be broken off. Consequently, the fuel supply to the engine is interrupted and the afterburner is cooled by the introduced air.

3,820,327

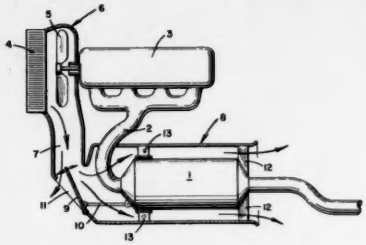
TEMPERATURE REGULATOR FOR A CATALYTIC REACTOR

Claude Henault, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed May 10, 1972, Ser. No. 252,067
Claims priority, application France, July 6, 1971, 71.24600
Int. Cl. F02b *75/10;* **F01n** *3/10*
U.S. Cl. 60—286 **2 Claims**

Device for regulating the temperature of a catalytic reactor for the depollution of the exhaust gases in internal combustion engines.

Cooling of the exchange surfaces of the reactor by a flow of air the flow-rate of which is substantially proportional to the increase in temperature of the reactor, the said flow being interrupted when the temperature drops below a predeter-



mined level. Means responsive to the reactor temperature control the regulation of the cooling air flow.

The catalytic depollution of exhaust gases of internal combustion engines.

3,820,328

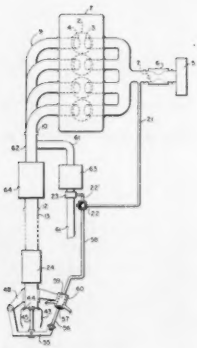
DEVICE FOR THE POST-COMBUSTION OF THE UNBURNT SUBSTANCES IN THE EXHAUST GASES OF THE INTERNAL COMBUSTION ENGINE OF A MOTOR VEHICLE

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Sept. 22, 1971, Ser. No. 182,656

Int. Cl. F02b 75/10; F01n 3/10

U.S. Cl. 60—288 **10 Claims**



A post-combustion device for the control of unburnt and polluting substances in the exhaust gases of the internal combustion engine of vehicles, in which there is provided a post-combustion chamber and a shut-off valve of the exhaust pipe, with this valve controlling whether the exhaust gases are conveyed through the post-combustion chamber or the latter is by-passed, the post-combustion chamber being positioned near the engine but the shut-off valve being positioned remote from the engine so as to obtain a particular relationship of the engine temperature with respect to these members.

3,820,329

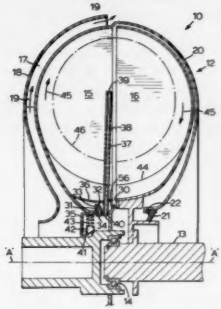
VENTED HYDRAULIC COUPLING

John E. Becker, Bowmanville, Ontario, Canada, assignor to Cluaran Associates Ltd., Oshawa, Ontario, Canada

Filed Feb. 12, 1973, Ser. No. 331,713

Int. Cl. F16h 41/30

U.S. Cl. 60—336 **7 Claims**



In a hydraulic coupling venting under all conditions of the torque-transmitting vortices is obtained by providing a first vent opening to a liquid-free space in the radially-innermost part of the working circuit. A second vent is provided opening to the centre of the working chamber, both vents being closed when the coupling pump is rotating at less than a predetermined speed by means of centrifugally-operated valve. The inlet to the first vent may be located downstream of a protecting step provided by the turbine and is provided with a deflector. With normal vortices the first vent is effective and with attenuated vortices at stall or its equivalent the second vent is effective.

3,820,330

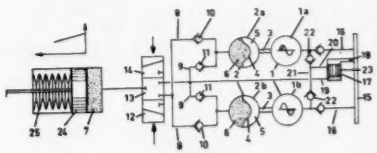
STIRLING CYCLE ENGINE POWER-CONTROL SYSTEM

Sven Anders Samuel Hakansson, Malmo, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed Oct. 17, 1972, Ser. No. 298,342

Int. Cl. F02g 1/04

U.S. Cl. 60-521 **9 Claims**



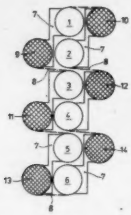
A system for controlling power in a Stirling Engine System by varying the effective volume of a working chamber which has a control chamber with a movable wall controlled by fluid pressure connected to vary the volume of working chamber. The fluid pressure is controlled by selectively connecting a reservoir of fluid under pressure to the control chamber by a control valve to increase or decrease the pressure and accordingly the volume of the control chamber.

3,820,331

DOUBLE-ACTING GAS MULTI-CYLINDER EXTERNAL COMBUSTION ENGINE

Gunter Reuchlein, Gersthofen, Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Germany

Filed June 13, 1973, Ser. No. 369,704
Claims priority, application Germany, June 27, 1972, 2231360
Int. Cl. F03g 7/06
U.S. Cl. 60—525 20 Claims



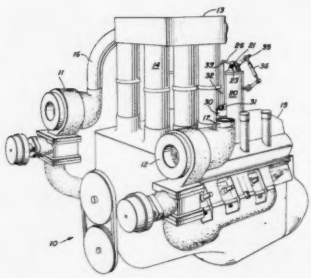
To provide an engine construction in which both the hot gas connections and the cold gas connections will not differ in length and will be short, the operating piston-cylinder units are aligned in a row and the regenerator-cooler units are disposed in two rows flanking the cylinder rows. The heater tubes forming part of the hot gas connections form one or more walls of tubes disposed above the cylinders, and a combustion chamber can be arranged to apply heat to these tubes in the upper part of the engine. Engines of various sizes may be built out of identical units comprising a cylinder, a regenerator cooler and a hot gas connection.

3,820,332

FUEL METERING CONTROL FOR FUEL INJECTION SYSTEMS

Eugene Melroy Crowe, Corte Madera, Calif., assignor to Ralph Salyer, Hammond, Ind., a part interest

Continuation of Ser. No. 150,688, June 7, 1971, abandoned. This application May 21, 1973, Ser. No. 362,573
Int. Cl. F02b 37/04
U.S. Cl. 60—13 R 4 Claims



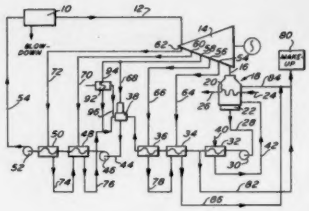
A fuel metering control device for use in controlling the position of an adjustable shuttle stop in a fuel distributing unit employed in a fuel injection system for internal combustion engines automatically controls the fuel-air mixture in response to throttle position as well as air pressure in the intake manifold.

3,820,333

METHOD OF TREATING BOILER MAKE-UP WATER

Robert A. Tidball, Swarthmore, Pa., and Gene F. Lauro, Greenfield Heights, N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.

Filed Feb. 24, 1971, Ser. No. 118,255
Int. Cl. F01k 7/40, 7/38
U.S. Cl. 60—667 14 Claims



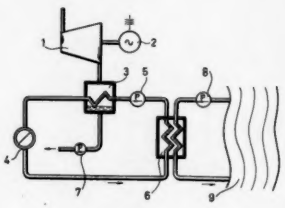
Hot condensate from feed water heaters is drawn off and mixed with make-up water, and the mixture heated and deaerated using turbine exhaust steam.

3,820,334

HEATING POWER PLANTS

Laszlo Heller; Laszlo Forgo, and Gabor Tomcsanyi, all of Budapest, Hungary, assignors to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat, Budapest, Hungary

Filed July 28, 1972, Ser. No. 276,201
Claims priority, application Hungary, Aug. 3, 1971, HE 593
Int. Cl. F01k 9/00
U.S. Cl. 60-688 4 Claims



Steam produced by a turbine in the course of generating electric power is released through conduit means into one or more surface condensers, where it is condensed. Heat exchange fluid contained in a closed system including a heat consumer outlet is continuously recycled under pressure through the one or more surface condensers wherein the fluid is warmed. When the heat exchange fluid is insufficiently cooled by passage through the heat consumer outlet, supplementary cooling means are provided to cool the heat exchange fluid prior to recirculation through the one or more surface condensers.

3,820,335

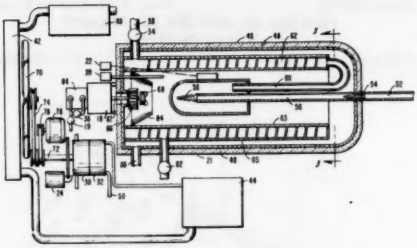
STEAM PROPULSION SYSTEM

William A. Maher, 9504 Orion Ave., Sepulveda, Calif. 91343

Filed July 26, 1971, Ser. No. 165,987
Int. Cl. F01d 25/32
U.S. Cl. 60-670 4 Claims

The invention relates to a system for propulsion utilizing a vapor heat transfer generator to create high pressure steam

directly from water vapor which is transferred to rotary cylinder motors of positive displacement design, which are run



on ball and roller bearings to eliminate friction facilitating high speed operation.

3,820,336

CONDENSATION PLANT FOR A STEAM TURBINE

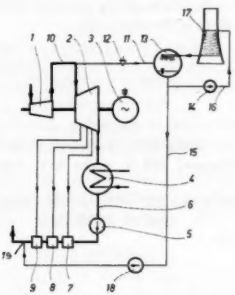
Alfred Schwarzenbach, Wettingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed July 13, 1972, Ser. No. 271,419

Claims priority, application Switzerland, Aug. 9, 1971, 11708/71

Int. Cl. F01k *19/10;* **F01b** *31/08*

U.S. Cl. 60–693 **4 Claims**



A steam power plant consisting of high and low pressure turbine sections coupled together to drive a load such as an electric generator is provided with a composite condensing system which consists of a water-cooled main condenser connected to the steam discharge of the low pressure turbine section and an air-cooled auxiliary condenser connected to receive steam from the steam flow path intermediate the high and low pressure turbine sections. Steam flow to the auxiliary condenser can be controlled by valve means operated manually or automatically, as required, depending upon various limiting environmental parameters related to the available water supply for the main condenser.

3,820,337

PRIMARY FUEL BURNING APPARATUS

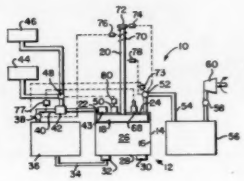
Stephen F. Martin, 23347 105th Ave., S.E., Kent, Wash. 98031

Filed Oct. 30, 1972, Ser. No. 301,970

Int. Cl. F01b *21/00*

U.S. Cl. 60–699 **11 Claims**

A primary fuel burning apparatus to efficiently burn fuel and transfer the resulting work energy to secondary apparatus such as a motor, to perform useful work, such as powering a traveling vehicle. There is a burning unit comprising a cylinder having a reciprocating piston which defines in the cylinder a combustion chamber and an air pumping chamber. On a combustion stroke of the piston, air is forced from the air pumping chamber into a compressed air container, from which compressed air is in turn directed into the combustion chamber for



subsequent combustion strokes. At the completion of the combustion stroke of the piston, a spring causes the piston to travel on a return stroke, forcing the gaseous combustion product from the combustion chamber into a combustion gas collecting chamber. The combustion gas is then selectively directed to a secondary unit, such as a turbine, an air motor, or an electrical generator, to perform useful work.

3,820,338

DRIVE SYSTEM FOR SHIPS WITH MAIN AND AUXILIARY ENGINES FOR ADDITIONALLY DRIVING AN ELECTRIC GENERATOR

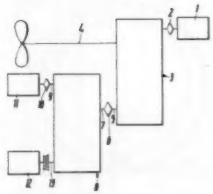
Heinz M. Hiersig, Dusseldorf-Oberkassel, Germany, and George T. R. Campbell, Tokyo, Japan, assignors to Mannesmann-Meer Aktiengesellschaft, Monchengladbach, Germany

Filed Feb. 20, 1973, Ser. No. 333,628

Claims priority, application Germany, Feb. 18, 1972, 2208511

Int. Cl. F01b *21/00*

U.S. Cl. 60—717 **9 Claims**



A power plant for ships with main and auxiliary engines, a main gear box, a superimposing gear and a generator. The auxiliary engine can drive the ship and/or the generator in case of main engine failure or stopping for other reasons. The superimposing gear keeps the generator speed constant when driven from the main engine. The superimposing gear has its two input shafts governed by clutches, and additional couplings determine the path of torque transmission from the auxiliary engine.

3,820,339

ARTIFICIAL SEAWEED CUT FROM CONTINUOUS BAND

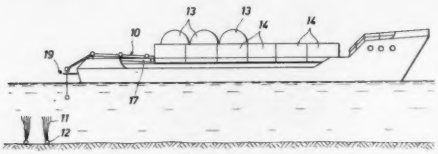
Rafael Fernandez Luque, Rijswijk, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed Apr. 9, 1973, Ser. No. 349,363

Claims priority, application Great Britain, Apr. 18, 1972, 17889/72

Int. Cl. E02b *3/04*

U.S. Cl. 61—3 7 Claims



This invention relates to a process for preparing artificial seaweed at the site where the seaweed is to be dropped into a body of water by (a) forming a continuous band of flexible, buoyant, synthetic polymer strands, (b) securing anchoring bodies transversely to the length of the polymer band at intervals along the length of the band, and (c) cutting the band between successive anchoring bodies. The invention also includes apparatus for carrying out the process.

3,820,340

CORRUGATED PLASTIC PIPE AND DRAINAGE SYSTEM USING THE SAME

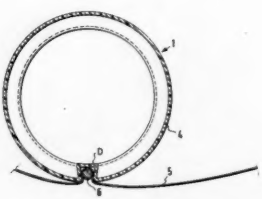
Heinrich Jenner, Hassfurth, and Georg Schmidt, Konigsberg, both of Germany, assignors to Franische Isolierrohr-Und Metallwaren-Werk Gebrueder Kirchner, Konigsberg, Bayern, Germany

Filed July 18, 1972, Ser. No. 273,559

Claims priority, application Germany, July 20, 1971, 7127845

Int. Cl. E02b *11/00*

U.S. Cl. 61—11 11 Claims



A corrugated synthetic plastic pipe is provided with alternate circumferential ridges and hollows. In the hollows the wall of the pipe is formed with apertures and some or all of the ridges are formed in their exterior side with a respective radially inwardly divergent depression, all such depressions being aligned in axial direction of the pipe. A system utilizing such a pipe is provided with a foil of synthetic plastic material on the upper side of which the pipe is deposited, whereas at the lower side of the foil there is provided a strand of material which is pushed with a surrounding portion of the foil into the respective depressions to be retained by snap action therein.

3,820,341

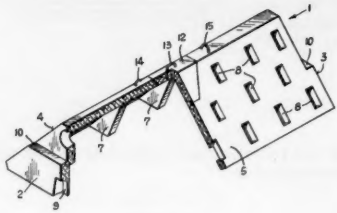
LEACHING CHAMBER

Roger Richard, 230 Cedar Ln., Torrington, Conn. 06790, and Robert Eugene Brugger, Torringford East, New Hartford, Conn. 06790

Filed Apr. 26, 1973, Ser. No. 354,487

Int. Cl. E02b *13/00*

U.S. Cl. 61—13 3 Claims



An efficient distributing leaching chamber adapted for multiple unit installation comprising slanted side walls joined at their tops to form an inverted V-shaped chamber, said walls being holed at suitable intervals for access to and from said chamber which is enclosed by triangular end walls provided with exterior set backs for stacking units. Access to the chamber is provided through the juncture of the side walls and knock out sections in the end walls.

3,820,342

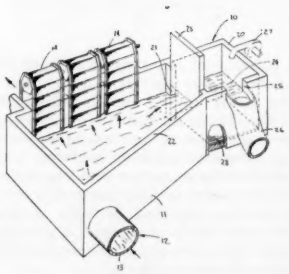
FISH EJECTOR SYSTEM

Jerome A. Stipanov, 251 S. Anita Ave., Los Angeles, Calif. 90049

Filed Nov. 22, 1971, Ser. No. 200,920

Int. Cl. E02b *8/08*

U.S. Cl. 61—21 16 Claims

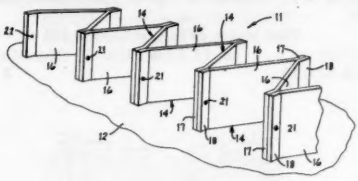


Asystem for removing fish from a moving stream of water by attracting or directing the fish away from the main flow of the stream into a defined zone. The fish attracted to the zone are trapped therein and subsequently removed to another discharge stream which returns the fish to the source of the first stream or to another location substantially without injury to the fish.

3,820,343
SELF-SUPPORTING WALL

George J. Morren, Zeeland, and Neil R. Berndt, St. Joseph, both of Mich., assignors to Speidel Foundation & Marine, Inc., Benton Harbor, Mich.

Filed Mar. 28, 1973, Ser. No. 345,492
Int. Cl. E04b *1/344*
U.S. Cl. 61—35 12 Claims

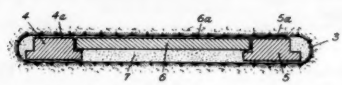


A self-supporting wall construction comprising a plurality of V-shaped modules connected together to form a zig-zag shaped wall. Each module comprises a pair of wall segments which extend at an angle relative to one another and have their adjacent ends connected together. The pair of wall segments of each V-shaped module are connected by a substantially horizontal hinge, and the adjacent modules are similarly connected by horizontal hinges whereby the individual wall segments are permitted to vertically pivot relative to one another to conform to an unlevel supporting surface. This hinging movement also enables the individual wall segments to relatively move as required by the external loads imposed thereon.

3,820,344
WATERTIGHT WALL OF ANY DESIRED LENGTH, WITHOUT JOINTS, CONSTRUCTED BY CUTTING TRENCHES IN THE GROUND, AND METHOD FOR ITS CONSTRUCTION

Claude Caron, Samoreau, and Jean Hurtado, Paris, both of France, assignors to Soletanche, Societe Anonyme, Paris, France

Continuation of Ser. No. 185,976, Oct. 4, 1971, abandoned. This application June 25, 1973, Ser. No. 373,226
Claims priority, application France, Oct. 15, 1970, 70.37236
Int. Cl. E02d *5/20*
U.S. Cl. 61—35 8 Claims



A watertight wall and method of forming a wall in the ground is provided. The wall uses a cement slurry of bentonite which will not exceed a viscosity of 20 centipoises after 48 hours of setting. Prefabricated parts are positioned in the wall after pouring and can be identically shaped.

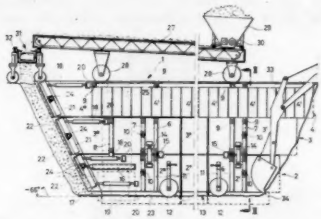
3,820,345
APPARATUS FOR LAYING PIPE

Heinz Brecht, Angerbergstrasse 2, Rheinsheim, Germany

Filed July 14, 1972, Ser. No. 271,974
Claims priority, application Germany, July 16, 1971, 2135577
Int. Cl. E21d *5/00*; F16l *1/00*; E02f *3/62*
U.S. Cl. 61—41 A 15 Claims

A method and apparatus for laying pipe in which a cage is provided that can be lowered into a pit in the ground with the cage having spaced side walls and being open at one end and at the bottom while having a longitudinally moveable end wall at the other end.

A conveyor system associated with the cage transfers earth excavated at the one end of the cage down to the other end of

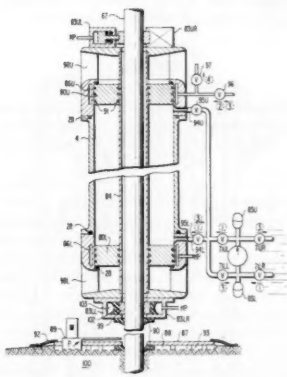


the cage outside the end wall of the cage and hydraulic motors are provided between the end wall of the cage and the side walls to advance the cage toward the region being excavated while pipe is laid along the bottom of the pit in excavated region below the level of the aforementioned end wall.

3,820,346
FREE PISTON WATER HAMMER PILE DRIVING

Serge S. Wisotsky, Sharon, Mass., assignor to Orb, Inc., Marion, Ohio

Continuation-in-part of Ser. No. 163,422, July 16, 1971, abandoned. This application June 30, 1972, Ser. No. 267,740
Int. Cl. E02d *7/28*
U.S. Cl. 61—53.5 6 Claims



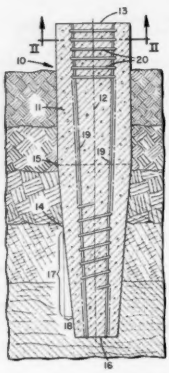
Driving long piles into submerged lands with a liquid ram or spear generated in a free-piston evacuated tube. Various drivers are enclosed. In one embodiment, the pile itself is used as at least a portion of the working chamber for generating water hammer. In another, the working chamber is a tube separate from the pile.

3,820,347

TAPERED PILES AND METHODS OF USING TAPERED PILES

William H. Medema, Fort Lauderdale, Fla., assignor to Oolite Industries, Inc., Miami, Fla.

Filed Nov. 1, 1971, Ser. No. 194,109
Int. Cl. E02d 5/30, 27/12
U.S. Cl. 61—56 9 Claims



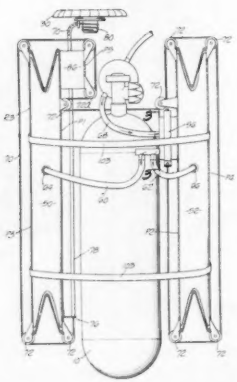
A molded concrete tapered piling which is reinforced or prestressed and has a preferred amount of taper per unit length of piling, and method of using said piling by driving it into earth stratas including stratas wherein it has been found that straight-sided pilings of comparable length do not provide sufficient load-bearing capacity, lateral support and uplift anchorage for a structure to be built thereon.

3,820,348

BUOYANCY REGULATING APPARATUS

Gregory M. Fast, 9951 Grosalia Way, La Mesa, Calif. 92041

Filed July 23, 1973, Ser. No. 381,637
Int. Cl. B63c 11/02
U.S. Cl. 61—70 8 Claims



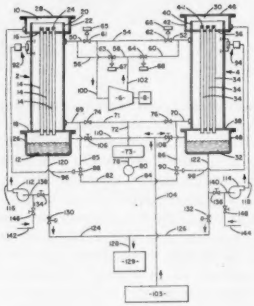
Buoyancy regulating apparatus is provided which permits a scuba diver wearing the apparatus to attain and maintain a desired buoyancy while descending or ascending in the water and regardless of his depth. The apparatus includes flexible bladders which are automatically inflated when their volume tends to decrease, and which are automatically deflated when their volume tends to increase, so that an equilibrium volume condition is maintained regardless of external water pressure.

3,820,349

SLUDGE SEPARATION SYSTEM

James S. Styron, North Syracuse, and Zolian Mandy, Camillus, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 1, 1973, Ser. No. 356,235
Int. Cl. F25b 29/00
U.S. Cl. 62—58 8 Claims



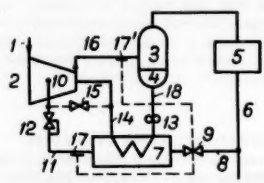
A sludge separation system including a reversible refrigeration circuit having a set of sludge receiving heat exhangers which alternate between evaporating and condensing functions to periodically freeze and thaw sludge to effect the separation of solid constituents therein, and a compressor which operates only when the pressure differential of the refrigerant in the heat exchangers is insufficient to force the refrigerant from the evaporator to the condenser.

3,820,350

ROTARY COMPRESSOR WITH OIL COOLING

Tore Brandin, and Anders Lundberg, both of Norrkoping, Sweden, assignors to Stal Refrigeration, Norrkoping, Switzerland

Filed Dec. 14, 1972, Ser. No. 314,989
Int. Cl. F25b 31/00
U.S. Cl. 62—193 12 Claims



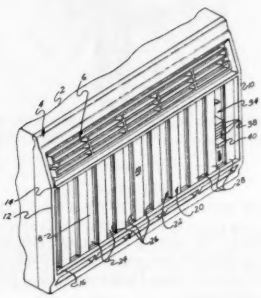
In a rotary-type compressor for a refrigeration plant, a lubricating oil cooling system which utilizes a portion of the condensed refrigerant as coolant for the oil and feeds back the

refrigerant to the compressor at a point where the pressure levels of the compressor and the returning refrigerant are substantially equal.

3,820,351
AIR CONDITIONER GRILLE ASSEMBLY

Walter Baker, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed July 27, 1973, Ser. No. 383,077
Int. Cl. F25d *29/00*
U.S. Cl. 62—267 **8 Claims**

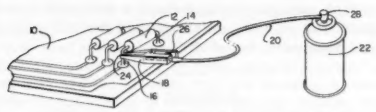


A room air conditioner front assembly having a slidably arranged panel operable from an open position exposing the air inlet and affording access to the air conditioning controls, to a closed position providing a decorative face by shutting the air inlet and hiding the controls. Operation of the air conditioner controls to an ON position provides an effective interlock which prevents the panel from moving to close the air inlet when the controls are in the ON position and the air conditioner is operating.

3,820,352
EVAPORATIVE COOLANT HEAT SINK

Richard A. Mahler, 77 Golf Rd., Ridgefield, Conn. 06877

Filed Jan. 5, 1973, Ser. No. 321,451
Int. Cl. F25d *3/00*
U.S. Cl. 62—293 **3 Claims**

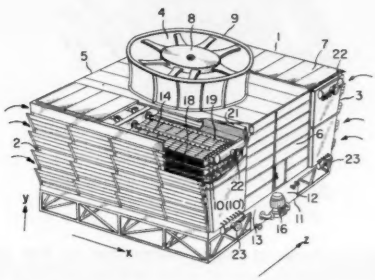


An efficient localized heat sink for use in the assembly and disassembly of electronic circuits. An evaporative coolant is caused to flow to a thermally conductive fitting attached to an electronic component or element being protected. The evaporation of the coolant on the fitting causing cooling thereof and cooling of the associated circuit element in conductive relation therewith. The conducting fitting can be of various configurations to accommodate particular circuit elements to be cooled.

3,820,353
EVAPORATIVE COOLING APPARATUS

Hiroo Shiraishi, Fukuoka; Hiroyoshi Kurohara, Chikushi; Shinjiro Tomita, Fukuoka; Senji Takenaka; Nobuo Yamada, both of Yokohama, and Motoyoshi Hashitani, Niiza, all of Japan, assignors to Japan Gasoline Co., Ltd. and Shin-Nihon Reiki Co., Ltd., Fukuoka, Japan

Filed Nov. 9, 1972, Ser. No. 305,127
Claims priority, application Japan, Nov. 11, 1971, 46-90381; Nov. 11, 1971, 46-90382; Mar. 6, 1972, 47-22373; Mar. 22, 1972, 47-28670
Int. Cl. F28d *5/00*
U.S. Cl. 62—305 **13 Claims**



An evaporative cooling apparatus comprising an outer casing provided with air inlets and an air outlet, cooling units composed of serpentine heat exchanging pipes and disposed for cooling indirectly and continuously a fluid to be cooled, fillers disposed in voids formed between two adjoining stages of the heat exchanging pipes by serpentine configuration of the heat exchanging pipes, a fan mounted to pass air through the cooling units, a liquid distributor for sprinkling a coolant liquid to the cooling units, a basin for receiving the coolant liquid which has been sprinkled from said liquid distributor and flown downwardly through the cooling units, and an eliminator provided to prevent splash liquids formed in the outer casing from dispersing outside the outer casing.

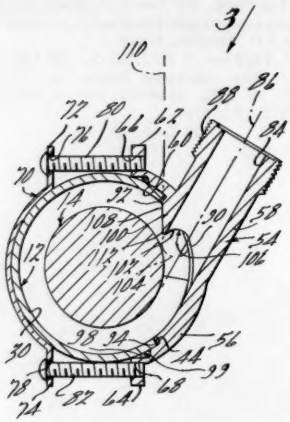
3,820,354
ICE MAKING APPARATUS

Vance L. Kohl, and Robert P. Utter, both of Albert Lea, Minn., assignors to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed June 12, 1972, Ser. No. 261,609
Int. Cl. F25c *1/14*
U.S. Cl. 62—354 **20 Claims**

An ice making apparatus comprising a tubular housing member defining an ice forming chamber and providing an inner surface on which thin layers of ice are formed, auger means rotatably mounted in the ice forming chamber and having a generally cylindrical main body portion and a helical blade extending outwardly therefrom and terminating adjacent the inner surface of the tubular housing member, an ice compacting chamber at one end of the ice forming chamber, a discharge opening provided in the tubular housing member in general alignment with the ice compacting chamber, a discharge spout mounted on the housing member and including a mounting section fixedly secured to the member and a discharge section defining an ice discharge passage terminating at the outer end thereof at an outlet end portion, means on the spout projecting into the discharge opening and defining an ice removing element disposed within the ice compacting chamber for deflecting ice from the compacting chamber outwardly through the discharge passage toward the outlet end portion, the discharge passage being arranged tangentially of

the axis of rotation of the auger and the element being disposed on the opposite side of the passage from which ice rotating in the compacting chamber approaches the passage,



whereby to provide an entirely unobstructed ice flow path from the compacting chamber to the outlet end portion of the spout.

3,820,355

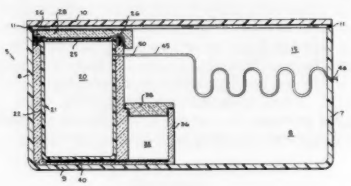
PORTABLE REFRIGERATOR AND FREEZER

Jose E. Olivares, 938 Christine, Houston, Tex. 77017

Filed Apr. 23, 1973, Ser. No. 353,788

Int. Cl. F25d *3/12*

U.S. Cl. 62—384 **4 Claims**



An insulated container is provided with a first and second insulated compartment, one of which is for receiving solid carbon dioxide. Metal is positioned to communicate the cooling effect of the carbon dioxide as it changes to fluid from the first compartment to the second compartment. Removable closures are provided for each of the compartments as well as the container and a conduit extends from the first compartment and terminates in an opening in the container so that the carbon dioxide as it changes to fluid may be vented to atmosphere. A restriction is provided in the conduit to regulate or control the rate fluid flow of the carbon dioxide.

3,820,356

ABSORPTION-REFRIGERATION PLANT WITH AUXILIARY GAS

Hans Stierlin, Rainweg 15,, 8952 Schlieren, Switzerland

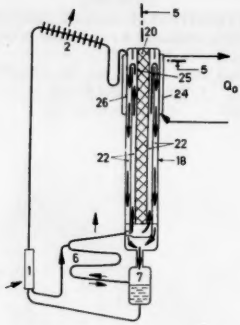
Filed May 1, 1972, Ser. No. 251,536

Claims priority, application Switzerland, May 7, 1971, 6878/71

Int. Cl. F25b *15/10*

U.S. Cl. 62—490 **9 Claims**

A refrigeration or cooling plant based on the absorption principle using auxiliary gas. The auxiliary gas circulating system in the vaporizer and heat exchanger sections of the plant, is subdivided into two or more circulating lines. An upward and downward directed channel is provided for each circulating line and serves as tbe driving means for moving flow



through the lines. The driving means and inflow lines to the circulating lines provide for uniform distribution of the flow through the circulating lines. Hydrogen is used for the auxiliary gas in the cooling plant.

3,820,357

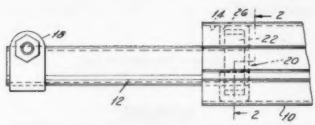
UNIVERSAL JOINT

William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 19, 1972, Ser. No. 290,304

Int. Cl. F16d *3/06*

U.S. Cl. 64—23 **8 Claims**



A universal joint constructed in accordance with one embodiment of the invention provides an operative connection between driving and driven tubular shafts of triangular cross section. A three corner intermediate member connected to the end of the smaller of the two shafts carries bearing means which slidably engage grooves formed in the interior of the other shaft. The joint accommodates angular and axial displacement between the two shafts.

3,820,358

APPARATUS FOR KNITTING PILE FABRIC

Daniel Frishman, 14 Castle Heights Rd., Andover, Mass. 01810

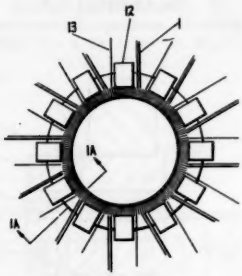
Filed June 19, 1972, Ser. No. 263,976

Int. Cl. D04b *9/14*

U.S. Cl. 66—9 B **2 Claims**

Discrete fibers arranged in a continuous and cohesive length, preferably in the form of a roving or loosely spun yarn are fed to the needles of a circular knitting machine through a yarn guide tube. The roving or loosely spun yarn is engaged by the hooks of the needles. The roving or loosely spun yarn is then disrupted by brushing which causes the fibers to be

reformed from a continuous length of fibers into individual tufts with each tuft engaged by a needle. Thereafter a backing



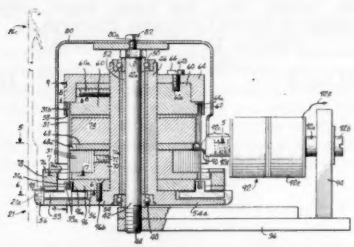
yarn is fed to the needles and the yarn and tufts are knitting into a pile fabric with the pile on one side of the backing yarn.

3,820,359

CIRCULAR KNITTING MACHINE WITH ELECTROMAGNET-OPERATED PATTERN WHEEL

William D. Hanson, and Carl H. Hanson, both of Brooklyn, N.Y., assignors to Pickford Mills, Inc., Brooklyn, N.Y.

Filed May 11, 1971, Ser. No. 142,129
Int. Cl. D04b *15/76, 15/78*
U.S. Cl. 66—50 A **17 Claims**



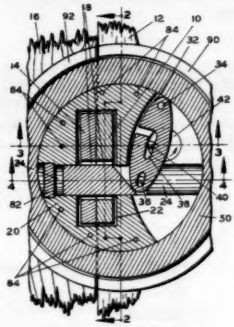
A pattern wheel for a circular knitting machine of the type having a rotating needle cylinder and program means for generating program instructions directing the pattern wheel to raise selected needles from nonknitting to knitting position. The pattern wheel comprises a cylindrical array of reeds made of magnetic material and an array of radially arranged needle raising jacks, with the bottom end of each reed engaging a jack for moving the jack between a retracted and an extended jack position. A jack in the extended position engages a knitting needle to raise it to knitting position. The reeds move between an outer reed position at which they are attracted by and held against the inner face of an outer annular magnet, and an inner reed position at which they are attracted by and held against the outer face of an inner circular magnet. Selected reeds are moved to the outer reed position by an electromagnet operating under the control of the program means. The electromagnet includes a convex pole facing the outside of the cylindrical reed array, with the pole tip positioned adjacent to the reeds which are in the inner reed position. The cylindrical reed array rotates with respect to the pole tip. When the pole tip is magnetized as directed by the program means, the reed which is nearest the pole tip is attracted to and held against the pole such that it is pulled from the inner magnet toward the outer magnet as the reed array rotates, thereby moving a jack from the retracted jack position to the extended jack position to engage a knitting needle and raise it to knitting position.

3,820,360

HIGH-SECURITY HASP LOCK

Walter E. Best, c/o Best Lock Corp., P.O. Box 103, Indianapolis, Ind. 46206

Filed Nov. 27, 1972, Ser. No. 309,761
Int. Cl. E05b *63/00, 65/48, 67/36*
U.S. Cl. 70—6 **9 Claims**



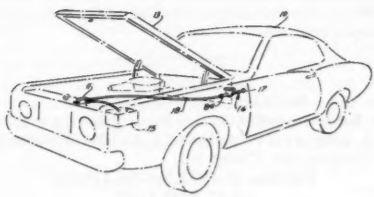
A high security lock totally encloses the projecting portions of a hasp and keeper. A protective outer cup-shaped housing surrounds, and is rotatable about, a lock body which fits over the projecting face-to-face hasp and keeper. A heavy bolt is movable in the body to a dead-locking position through the hasp and keeper, and is controlled by a key operated lock core mounted in the body and accessible only by an elongated key inserted through a guard plate in a constricted key hole in the outer housing. Hardened steel plates and pins in the lock body protect it from drilling and cutting.

3,820,361

AUTOMOTIVE ANTI-THEFT DEVICE

Erwin M. Leitner, 21-39 45th St., Astoria, N.Y. 11105

Filed Jan. 26, 1973, Ser. No. 326,637
Int. Cl. E05b *65/19*; **B60r** *25/04*
U.S. Cl. 70—241 **14 Claims**



An anti-theft device for an automobile including a support having a slidable rod or latch and a main switch which is open circuited when the rod is caused to extend from the support. The support is connected under the hood of the automobile and the switch is connected in series with the automobile's battery so that when the rod is extended to engage, and thereby lock the hood, the ignition circuit of the automobile is disabled. The position of the rod is controlled by a guided wire connected to a handle for pushing or pulling the rod. The handle is located in a cylindrical housing having tumblers for arresting movement of the handle when the rod is extended and for permitting movement of the handle when the tumblers are in predetermined positions. Thus, if the rod is extended and the tumblers are scrambled, the hood will be locked and the

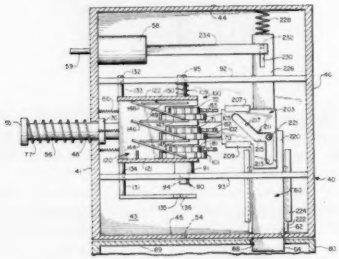
ignition circuit will be disabled until such time as the tumblers are returned to the predetermined positions and the handle is pulled. A current limited reset switch, connected in parallel with the main switch, allows the battery to supply power to the interior lights of the automobile when the main switch is opened but is caused to open if the ignition circuit demands current from the battery. Accordingly, the automobile's interior lights may be used to assist setting the tumblers in the predetermined positions unless the ignition circuit has been tampered with.

3,820,362

SINGLE-BUTTON MANIPULATION MECHANISM FOR USE IN LOCKS AND SWITCHES

Richard W. Strazza, 3 Turner Ct., Princeton, N.J. 08450, and John P. Mohrhauser, 804 Prospect St., Maplewood, N.J. 07010

Filed May 7, 1973, Ser. No. 357,560
Int. Cl. E05b *37/02*; **H01h** *27/10*
U.S. Cl. 70—306 **9 Claims**



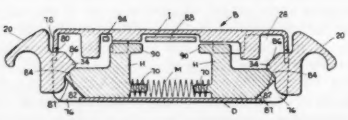
A mechanism for manipulating a plurality of members by means of reciprocating a single button. The button has connected thereto an arm which is guided into a manipulating engagement with each of the members by means of a series of mechanical gates. In a first embodiment, the members are incorporated in a combination lock and when they are manipulated to a predetermined position, the lock can be opened. In a second embodiment, the members are connected to electrical components and these are in turn connected to a circuit, wherein on manipulation of the members to anyone of a plurality of predetermined positions one of a plurality of electrical devices corresponding to only the specific predetermined position is activated.

3,820,363

BUCKLE COMBINATION LOCK

Lazlo Bako, Woodcliff Lake, and Henry Heine, Vernon, both of N.J., assignors to Presto Lock Co., Division of Walter Kidde & Company, Inc., Clifton, N.J.

Filed Jan. 25, 1972, Ser. No. 220,604
Int. Cl. E05b *37/02*
U.S. Cl. 70—312 **10 Claims**



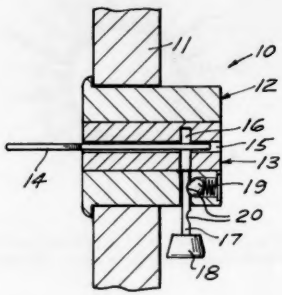
A combination lock of the multiple dial type is associated with the pivoted body of a buckle to releasably lock the body and its hook to the loop member of the buckle.

3,820,364

BAR DEVICE FOR KEYED LOCKS

Michael Greeley, 1610 Arlington St., Kingman, Ariz. 85401

Filed Mar. 23, 1973, Ser. No. 344,443
Int. Cl. E05b *17/14*
U.S. Cl. 70—419 **1 Claim**



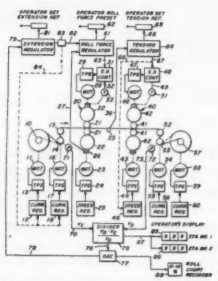
A manually operated bar available only at the inside of a cylinder lock prevents entry of a key.

3,820,365

AUTOMATIC EXTENSION CONTROL

Antonia Vicente Silva, Sao Paulo, Brazil, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 23, 1973, Ser. No. 344,323
Int. Cl. B21b *37/00*
U.S. Cl. 72—8 **12 Claims**



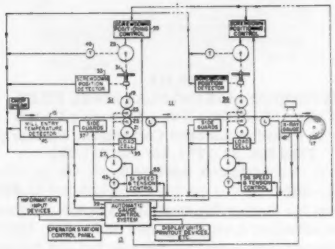
A rolling mill automatic control system made up of three subsystems in the form of (1) a mill stand roll force regulator; (2) a tension regulator; and (3) an extensiometer regulator. The roll force regulator controls the screwdown to maintain a constant roll force in the mill stand, or the first mill stand in a tandem mill arrangement. The tension regulator maintains constant delivery tension, or constant interstand tension in a two-stand mill arrangement. The extensiometer regulator introduces a change in the roll force reference value of the roll force regulator while at the same time, if desired, the extensiometer regulator delivers a corrective signal to the current regulator of the payoff reel or entry tension bridle if provided in the particular mill stand. The control circuit for the extensiometer regulator includes a divider block in either a digital or analog form to calculate the actual extension of the strip based on measured entry and delivery strip speeds.

3,820,366

ROLLING MILL GAUGE CONTROL METHOD AND APPARATUS INCLUDING TEMPERATURE AND HARDNESS CORRECTION

Andrew W. Smith, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1972, Ser. No. 303,723
Int. Cl. B21b *37/10*
U.S. Cl. 72—9 15 Claims



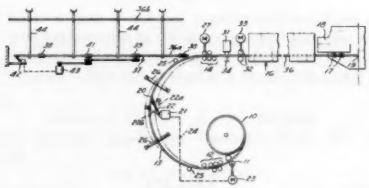
The roll openings of the respective roll stands of a tandem hot steel strip rolling mill are controlled in relation to the measured temperature of an approaching present workpiece, which is similar to a previous workpiece, and which measured temperature of the present workpiece is compared to the weighted average temperature of previous similar workpieces. In addition the workpiece hardness as indicated by the measured lock on roll force for the present workpiece and compared to the weighted average of the lock on roll forces of previous similar workpieces is used for control purposes. The automatic gauge control system calculates the screwdown movement correction required for correction of the roll opening of each roll stand in relation to the expected per unit change in stand roll force for at least one of these comparisons. The control system operates the mill screwdowns in accordance with these calculated screwdown movement corrections.

3,820,367

POWER FEED AND UNCOILER FOR HOT FORGING MACHINES OR THE LIKE

Gaylen O. Kline, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Filed Oct. 30, 1972, Ser. No. 302,042
Int. Cl. B21b *37/04*
U.S. Cl. 72—17 16 Claims



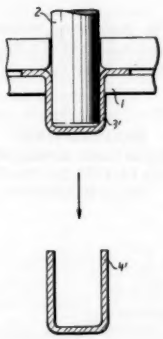
A hot forging machine system is disclosed in which stock in coil form having a first radius of curvature is supplied to the machine. The stock feed includes a preliminary powered straightener which partially straightens the coiled stock and feeds it into a loop. The intermittently driven forging machine feed rolls pull the stock from the loop through a secondary straightener to complete the straightening operation and through a heater which heats the stock before it reaches the forging machine. Sensing means determine the size of the loop and control the rate of operation of the preliminary straightener to maintain the size of the loop within predetermined limits. Undesirable elongation of the heated stock does not occur, since the force required to intermittently feed the stock through the secondary straightener is not sufficiently great to cause such elongation.

3,820,368

PROCESS FOR PRODUCING DRINKING CANS MADE OF ALUMINUM-PLATED STEEL SHEET

Toshio Fukuzuka, Kobe; Tsuyoshi Murakami, Kakogawa; Masaaki Urai, and Mitutoshi Sakaguchi, both of Kobe, all of Japan, assignors to Kobe Steel Limited, Kobe, Japan

Filed Feb. 16, 1973, Ser. No. 333,134
Int. Cl. B21c *23/24*; B21d *22/28*
U.S. Cl. 72—47 2 Claims



A process for producing drinking cans made of an aluminum-plated steel sheet which comprises: forming an aluminum-plated steel sheet having a Rockwell H_RB hardeness of 45 to 75; by hot dipping a steel sheet into a molten aluminum bath containing more than 3% silicon to form a plated layer on said steel sheet, wherein said plated layer consists of an alloy layer not more than 5μ thick and an aluminum layer not less than 5μ thick and wherein the total thickness of said aluminum layer and said alloy layer ranges from 8μ to 25μ; drawing and ironing said aluminum-plated steel sheet to form the cup portion of a two-piece drinking can, wherein said drawing initially is conducted at an ironing rate ranging from 0 to 15 percent and said ironing is conducted in three or four successive stages at ironing rates progressively lower than the ironing rate used initially for said first stage.

3,820,369

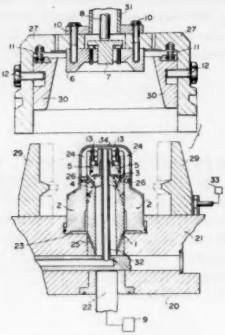
HYDRAULIC PRESS

Hiroshi Tominaga, No. 78, Matsugaoka, Kanagawa-ku, Yokohama-shi, Kanagawa-ken, and Kohei Adachi, No. 6527, Kowada, Chigasaki-shi, Kanagawa-ken, both of Japan

Filed Feb. 26, 1973, Ser. No. 336,130
Int. Cl. B21d *22/00*
U.S. Cl. 72—55 6 Claims

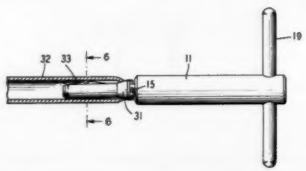
An improved hydraulic press for sequentially forming and perforating a workpiece including means responsive to hydraulic pressure for selectively forming a workpiece, means for introducing a hydraulic fluid into the workpiece forming means, means for selectively perforating the workpiece and means for actuating the perforating means for perforating the workpiece after formation thereof. The workpiece forming

means and hydraulic fluid introducing means are coupled to permit introduction of the hydraulic fluid into the workpiece.



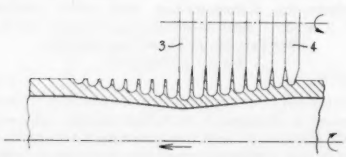
forming means. The perforating means is responsive to hydraulic pressure and is coupled with the workpiece forming means for perforating the workpiece.

3,820,370
BEADING TOOL
Edward J. Duffy, 30 Ann Street, Bernardsville, N.J. 07924
Filed July 14, 1972, Ser. No. 271,733
Int. Cl. B21d *39/14*
U.S. Cl. 72—75 **8 Claims**



A tool for manually forming outwardly shaped continuous beads in deformable tubing, for use with various tube fittings, is described. The beads are formed by a rolling member which is cam actuated outward during tool operation, to permanently deform tubing, thereby creating a fitting shoulder. The tool is shaped to eliminate the need for deburring, reaming or correcting minor deformation of tube diameter before use.

3,820,371
METHOD FOR ROLL-FORMING OF RIBBED PIPES
Alfred Kopetschke, Am Langen Bach near Voehringen/Iller, Germany, assignor to Wieland-Werke AG, Postfach, Germany
Filed Dec. 8, 1972, Ser. No. 313,424
Int. Cl. B21h *3/12*
U.S. Cl. 72—98 **4 Claims**

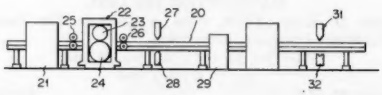


A method for roll-forming ribs onto pipes wherein at least the ends of the pipes are free of ribs. The ribbed pipes are rotated by driven roller disks due to a frictional engagement therewith and the pipes are moved forwardly due to a skewed relationship between the pipe and the roller disks. This invention is particularly characterized by the roller disks being driven at a lower speed of rotation during an in-feed operation and increased to an optimum operating rotational speed after the in-feed operation has been completed. The reduction in rotational speed on the roller disks depends on the material which is to be worked and is approximately one-fourth to one-third of the optimum operating rotational speed.

3,820,372
METHOD OF MAKING FLAT STEEL FILES
John G. Cutton, Boardman Twp., Mahoning County, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Dec. 22, 1971, Ser. No. 211,091
Int. Cl. B21b *3/02*
U.S. Cl. 72—203 **5 Claims**

A process for making flat steel files wherein a highcarbon steel is hot rolled on a wide strip mill and coiled. The coil is given a spheroidizing anneal and slit into bar and cut into flat bar stock. File blanks are cut from the flat bar stock and ground to remove a pure iron surface caused by the anneal. Thereafter, the file teeth or grooves are cut and the file hardened.

3,820,373
APPARATUS FOR MANUFACTURING LEAF SPRINGS HAVING A TAPERED END PORTION
Heijiro Shiguma, and Shigekazu Suzuki, both of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama-shi, Japan
Filed July 19, 1973, Ser. No. 380,580
Claims priority, application Japan, July 20, 1972, 47-72876; July 12, 1973, 48-78813
Int. Cl. B21h *8/00*
U.S. Cl. 72—185 **9 Claims**

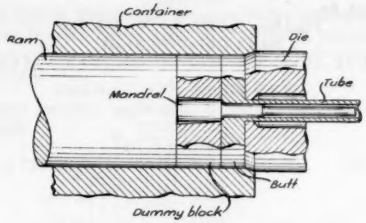


An apparatus comprises a furnace to heat a metal band, rolling mill rolls forming a plurality of tapers at portions of the heated metal band, shearing means to divide the tapered metal band into a plurality of leaf spring units with opposite tapered ends.

3,820,374
MANDREL FOR EXTRUDING TUBING
Karl F. Braeuninger, Ferguson, Mo., assignor to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 55,531, July 16, 1970, abandoned. This application Mar. 24, 1972, Ser. No. 237,689
Int. Cl. B21c *23/08*
U.S. Cl. 72—265 **22 Claims**

A mandrel and mandrel-dummy block assembly for extrusion of tubing is disclosed wherein the mandrel has a shaft

cross sectional area so related to the working section cross sectional area that the mandrel will stay in place without attachment to the dummy block. Such mandrel reduces the problems of mandrel necking down and breakage.

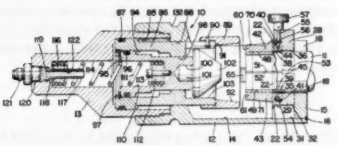


3,820,375

HYDRAULICALLY OPERATED TUBE FLARING TOOL

Jerry V. Koski, Parma, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Aug. 31, 1972, Ser. No. 285,421
Int. Cl. B21d *41/02*
U.S. Cl. 72—318 **8 Claims**



A hydraulically operated tube flaring tool having a housing with a side opening through which the tube and a portion of the collet for gripping the same can be moved in a sidewise direction for easy loading and unloading of the tool. The tool also has two hydraulically operated pistons, one for clamping the collet on the tube and the other for flaring the tube. The pistons are retracted by a tension spring. An arm is swingable transversely of the tool for locating the tube axially and is spring pressed to an out of the way position during the flaring operation.

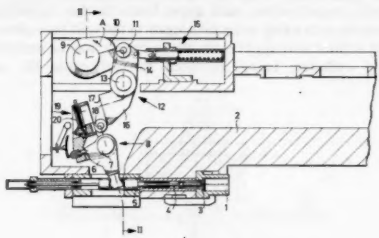
3,820,376

VARIABLE STROKE EJECTOR MECHANISM

Friedrich-Karl Koch, Krefeld, and Oskar Rahn, Kempen, both of Germany, assignors to Peltzer & Ehlers, Krefeld, Germany

Filed Aug. 18, 1972, Ser. No. 281,996
Claims priority, application Germany, Sept. 29, 1971, 2148528
Int. Cl. B21d *45/00*
U.S. Cl. 72—427 **7 Claims**

A die press ejector mechanism comprising a reciprocable ejector member, which engages a workpiece to eject the same from a die. The ejector member is engageable by one arm of a first oscillating bell crank, the other arm of which has a roller that is adjustable toward and away from the pivot axis of the bell crank. The roller is contacted by a plane surface which moves in a direction generally perpendicular to the line of adjustment travel of the roller. Preferably, the planar surface is provided on one arm of a second bell crank lever, the other arm of which is engaged by an actuating cam. As the second bell crank is oscillated by the cam, the planar surface pushes against the roller, causing the first bell crank to oscillate. The angular movement of the first bell crank depends upon the adjusted distance of the roller from the bell crank pivot axis.

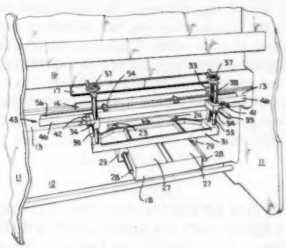


3,820,377

GAUGING APPARATUS FOR PRESSES AND THE LIKE

Gerald V. Roch, Indianapolis, Ind., assignor to Hurco Manufacturing Co., Inc., Indianapolis, Ind.

Filed Aug. 30, 1972, Ser. No. 284,895
Int. Cl. B21d *11/22*
U.S. Cl. 72—461 **21 Claims**



A power driven back gauge assembly on a press brake includes a housing with its front end affixed to the press brake bed and supported thereby. A carriage straddles the housing, supported by ball bushings on guide rods at each side of the housing, for linear movement toward and away from the press brake tooling. A penumatic cylinder inside the housing drives the carriage by means of a travel multiplying chain and sprocket system, and control is provided by a hydraulic cylinder secured to the pneumatic cylinder and having solenoid operated valves disposed inside the housing. A continuous back gauge bar is secured by adjustable connectors to supports mounted on the carriage.

3,820,378

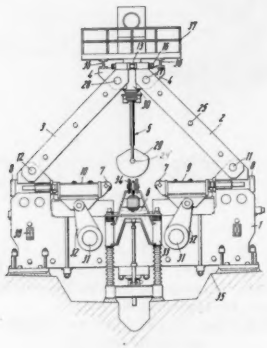
MACHINE FOR BENDING SHEET STOCK

Herbert Jansen, Rheydt, Germany, assignor to Mannesmann-Meer Aktiengesellschaft, Monchengladbach, Germany

Filed Apr. 11, 1973, Ser. No. 349,921
Claims priority, application Germany, Apr. 13, 1972, 2218419
Int. Cl. B21d *37/00*
U.S. Cl. 72—465 **8 Claims**

A machine for bending metal sheet or plate stock into a blank of U-shaped cross section, having a plurality of frames which are closed at the top and are disposed along a line in relation to which the stock is to be bent, each frame comprising an upper frame and a lower frame, there being sheet bending members in the lower frame and hydraulic press means

with bending punch; each of said upper frames having a pair of tension and tie bar members, hinged individually with their respective lower ends to the lower frame and being inclined towards each other for positions of their upper ends in close proximity to each other; each upper frame further including a horizontally extending cross tie hinged to the said bars close to but not at their said upper ends, the hydraulic means including a press cylinder, being mounted to said cross tie; and



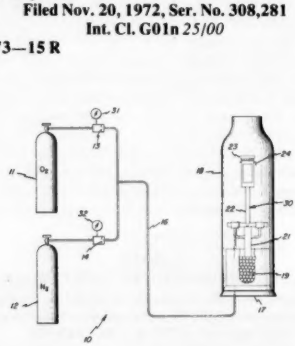
resiliently yielding hinge means at the said upper ends of said bar members for interconnecting bar members and hingedly connecting them to each other. The hinge means comprising a pair of bearing segments respectively connected to the upper ends of the bar members, a cylindrical hinge pin engaged by the segments; and tie rod means for resiliently urging the segments into engagement with the pin but permitting partial disengagement therefrom.

3,820,379

APPARATUS FOR DETERMINING THE OXYGEN INDEX OF LIQUID AND NON-MOULDED SOLIDS

Gordon L. Nelson, Schenectady, and Jimmy L. Webb, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 20, 1972, Ser. No. 308,281
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 R **3 Claims**



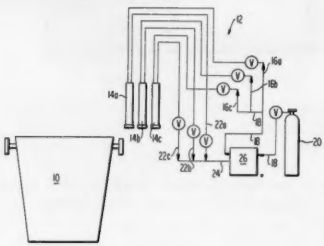
The utility of apparatus designed and operated for the determination of the oxygen index of a moulded polymer body has been greatly extended by making structural modifications to the prior art apparatus (introducing a removable sample receptacle) and by the invention of a new process for making the oxygen index determination on non-moulded materials, e.g. liquids, polymers or nonpolymers.

3,820,380

SAMPLING MOLTEN METAL BATHS

Gerald G. Miller, Toronto, Ohio, and Rox L. Zickefoose, Weirton, W. Va., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Nov. 3, 19[illegible] Ser. No. 303,503
Int. Cl. G01n *1/10, 31/08*
U.S. Cl. 73—19 **25 Claims**



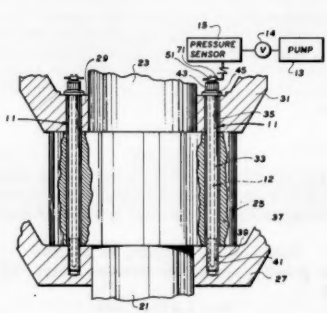
The concentration of a constituent in a molten bath is quickly determined by obtaining a sample in a reactor to form gaseous product related to the constituent, removing the gaseous product to an analytical zone and analyzing. For example, in determining the active oxygen content of a molten steel bath, a sample is obtained in a chamber where it contacts carbon whereby active oxygen is converted to carbon monoxide which is swept in a stream of carrier gas to a gas chromatographic station.

3,820,381

FASTENER SYSTEM AND METHOD FOR INSPECTING SAME

Glenn C. Thurston, Del Mar, Calif., assignor to Gulf Oil Corporation, San Diego, Calif.

Filed June 19, 1972, Ser. No. 263,879
Int. Cl. G01m *3/26*
U.S. Cl. 73—40 **6 Claims**

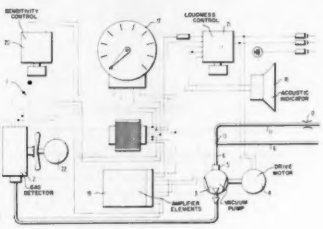


A fastener system is described in which one or more fasteners are each provided with an internal cavity coextensive with a region of potential failure of the fastener. A pressure is produced inside the cavity, the cavity is sealed off, and the pressure is monitored inside the cavity. A rapid pressure change indicates a defective fastener.

3,820,382
METHOD AND APPARATUS FOR DETECTING LEAKAGES IN THE VACUUM SYSTEM OF MOTOR VEHICLES

Rudolf Andres, Sindelfingen; Hermann Moller, Aidlingen, and Franz Seyfried, Sindelfingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Nov. 4, 1971, Ser. No. 195,671
Claims priority, application Germany, Nov. 5, 1970, 2054428
Int. Cl. G01m *3/04*
U.S. Cl. 73—40.7 **6 Claims**

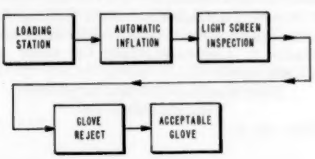


A method and apparatus for detecting leakages in the vacuum system especially of motor vehicles, according to which air is sucked out of the vacuum system and fed to a leak detector apparatus which detects the slightest traces of a test gas, externally charged into the surroundings of the place of the vacuum system where the leak is suspected.

3,820,383
GLOVE INSPECTION APPARATUS

Arthur J. Van Deventer, Madison, Conn., and David R. Poland, Fayette, Ala., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed June 4, 1973, Ser. No. 366,905
Int. Cl. G01m *3/36*
U.S. Cl. 73—41 **8 Claims**



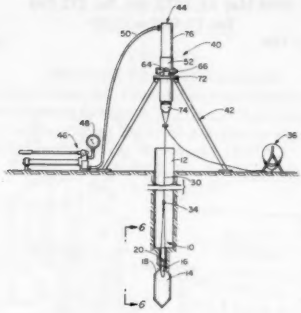
An automatic latex or rubber glove inspection apparatus wherein the articles to be inspected are automatically inflated subsequent to being mounted on an extended conveying mechanism. Such conveying mechanism being further arranged to traverse a distance that will allow the deflation of defective gloves enabling the selective automative removal and segregation of quality product.

3,820,384
SOIL TESTING APPARATUS AND METHOD

Murray I. Brill, 383 Ocean Ave., Massapequa Park, N.Y. 11762

Filed July 17, 1972, Ser. No. 272,592
Int. Cl. G01n *33/24*
U.S. Cl. 73—84 **7 Claims**

The method and apparatus of this invention relates to the measuring of the in-place static friction of soils. It consists of driving a flat or planar test plate into the soil; extracting the test plate and recording the maximum force required to effect extraction. The test plate is removably connected to a driving rod, which embeds it down in the soil. The driving rod is

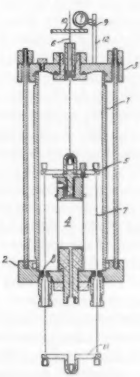


removed, and the test plate is then extracted by a cable secured thereto. The maximum extraction force is a measure of the in-place static friction of the soil. The test plate is temporarily connected to the driving rod by a line which breaks readily upon separation of the driving rod from the test plate.

3,820,385
CHAMBER FOR TESTING SOILS WITH TRIAXIAL STRESSES

Raul J. Marsal Cordoba, c/o Instituto de Ingenieria, Ciudad Univ., Mexico City, Mexico

Filed Jan. 16, 1973, Ser. No. 324,124
Int. Cl. G01n *3/08*
U.S. Cl. 73—84 **4 Claims**



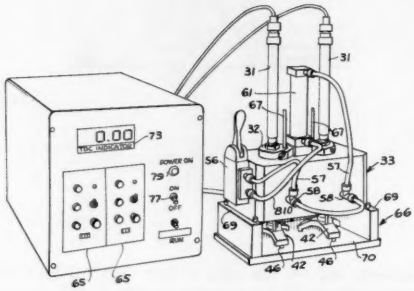
A novel chamber for testing soils with triaxial stresses is disclosed, the chamber comprising a cylinder of Lucite, having a metal base and cap, into which cylinder is placed a sample of soil or material to be subjected to a confining pressure by the application of an axial load that is transmitted to the sample by means of a system of peripheral wires which apply the load downwardly, and a central wire which, like the other wires, passes to the outside of the chamber and transmits the deformations of the sample subjected to pressure to a micrometer supported on a plate which is connected to the upper wire.

3,820,386

METHOD AND APPARATUS FOR DETERMINING TOP DEAD CENTER IN INTERNAL COMBUSTION ENGINES

Henry W. Grikscheit, Bloomfield, and Vernon G. Converse, III, Franklin, both of Mich., assignors to Scans Associates, Inc., Livonia, Mich.

Filed May 12, 1972, Ser. No. 252,594
Int. Cl. G01m 15/00
U.S. Cl. 73—116 20 Claims



The specification discloses a novel method and apparatus for determining in an uncomparably more precise manner than was possible heretofore the top dead center in one selected cylinder of an internal combustion engine, to provide a reference point to which all of the ensuing adjustments in tuning the engine are referred.

In accordance with the invention, the determination of the top dead center in the selected cylinder of an internal combustion engine is made not on the basis of movement of the piston, or pistons, or position of a journal, determination of which is being made, but on the basis of movement of the piston or position of the journal in another cylinder having set relationship to the position of the piston or journal in the selected cylinder. Generally, the relation is such that movement of the piston along the straight line is very small near the top dead center compared to the angle of crankshaft rotation, and determination of the top dead center made on the basis of such movement would be only approximate and unreliable.

In accordance with the invention determination of the top dead center is made on the basis of movement of the piston in another cylinder in the position at or near the mid-stroke of the piston when the movement of the piston for the same angle of crankshaft rotation is the largest and when such movement referred to the position of the piston in the selected cylinder enables marking position of the top dead center of the piston in such selected cylinder with much greater precision.

Generally, the above relationship may be compared to the sine and cosine relationship. At or near the top dead center the movement of the piston is proportional to the cosine of the angle of crankshaft rotation, and at or near the mid-stroke of the piston — proportional to the sine of such angle.

Thus, determination of the top dead center in one selected cylinder resolves itself to determination of the position at or near the mid-point stroke of a piston having set relation to the position of piston in a selected cylinder, and having found that position marking the position of the piston in a selected cylinder as being precisely at the top dead center.

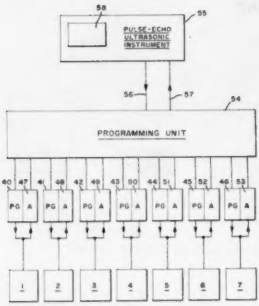
The specification also discloses the method and apparatus for determining mid-stroke (or two-third stroke for six-cylinder engine) position of the related piston by balancing position of two adjacent pistons, one moving downwardly and one moving upwardly, both mechanically and electrically, as well as finding such positions by setting respective journals of the crankshaft accordingly.

3,820,387

PROBE SYSTEM FOR ULTRASONIC NONDESTRUCTIVE TESTING

Werner Grabendorfer, Bensberg-Refrath; Manfred Gregor, Rondorf near Cologne, and Udo Schlengermann, Hurth-Hermulheim, all of Germany, assignors to Krautkramer-Branson Incorporated, Stamford, Conn.

Filed Apr. 11, 1973, Ser. No. 350,167
Claims priority, application Germany, Apr. 12, 1972, 2217528
Int. Cl. G01n 29/00
U.S. Cl. 73—67.9 7 Claims



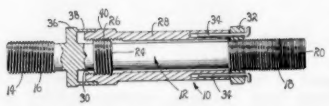
A pulse-echo ultrasonic test system comprises an array of probes disposed along the surface of a test specimen. The array is divided into groups, each group comprising a plurality of probes. A control circuit sequentially renders each group of probes operative in a predetermined sequence to cover the exposed length of the specimen. Certain adjacent probes are rendered operative during the time interval in which two adjacent but different groups are rendered operative to provide an overlap, while other probes are rendered operative only once during a complete cycle in which all of the groups are rendered operative.

3,820,388

DEVICE FOR MEASURING TENSILE FORCES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Walter T. Appleberry, 3440 Val Verde Ave., Long Beach, Calif. 90808

Filed May 21, 1973, Ser. No. 361,907
Int. Cl. G01l 1/04
U.S. Cl. 73—141 A 5 Claims

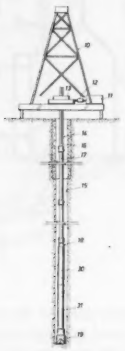


A device for measuring tensile forces, characterized by an elongated body having predetermined elastic properties, whereby applied tensile force of any magnitude, within a given range, imparts to the body an elongation of a predetermined length, a sleeve mounted on the body in threaded relation therewith and an internally threaded, axially displaceable nut pinned to the sleeve, the threads of said nut being finer than the threads of said sleeve, whereby the sleeve is caused to advance axially relative to the nut as torque-induced angular motion is imparted to the sleeve and nut at a common rate. The magnitude of applied tensile force is indicated as a function of the angular motion afforded the sleeve.

3,820,389
METHOD AND APPARATUSES FOR TRANSMISSION OF DATA FROM DRILL BIT IN WELL WHILE DRILLING

Albert P. Richter, Jr., Houston, and William R. McEvers, Jr., Bellaire, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 20, 1972, Ser. No. 290,676
Int. Cl. E12b *47/12*
U.S. Cl. 73—151 **22 Claims**

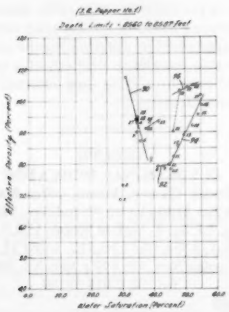


A method and several mechanisms for carrying out the method are disclosed. The method of (1) generating torque pulses by engaging and disengaging a torque generator on the lower end of a drill string in the bottom of a wellbore, and (2) monitoring the top of the drill string for the torque pulses therein may be practiced by an inertial wheel detachaby coupled to a drill collar on the lower end of a rotating drill string in a wellbore for being momentarily and precisely coupled and uncoupled during drilling for generation of torque pulses in the drill string for being monitored at the surface. Mechanical, electrical, and fluid operated couplings are disclosed for rapidly braking the rotating inertial wheel.

3,820,390
METHOD OF RECOGNIZING THE PRESENCE OF HYDROCARBONS AND ASSOCIATED FLUIDS IN RESERVOIR ROCKS BELOW THE SURFACE OF THE EARTH

James M. Forgotson, 147 Jordan St., Shreveport, La. 71101

Filed July 27, 1970, Ser. No. 58,400
Int. Cl. E21b *49/00*
U.S. Cl. 73—152 **22 Claims**

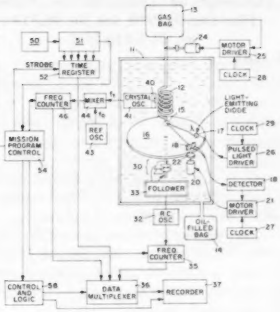


This invention relates to methods of recognizing the presence of hydrocarbons and associated fluids in reservoir rocks (strata) below the surface of the earth. A determination is made of the relationship between the porosity and the water (salt water or fresh water) in the pore spaces of the reservoir rocks. When certain relationships exist between the porosity and the water, the presence of recoverable hydrocarbons and associated fluids and non-water miscible substances is indicated.

3,820,391
DEEP SEA PRESSURE GAUGE

Donald James Baker, Jr., Cambridge; Ivan Winfield Hill, Newton, and Richard B. Wearn, Jr., Cambridge, all of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1973, Ser. No. 350,563
Int. Cl. G01i *19/00*
U.S. Cl. 73—170 A **12 Claims**



A deep sea pressure gauge for measuring and recording pressure and temperature stably and accurately over long periods of time at the sea floor is provided. A fused quartz Bourdon tube pressure sensor and a quartz crystal oscillator temperature sensor provide high stability at low power. Only pressure variations from the sea floor pressure are measured, the mirror of the Bourdon tube rotating at a rate proportional to this pressure differential and controlling an angular position transducer having a frequency output. The pressure and temperature signals measured are average values covering the time between recordings. An argon-filled bag exposed to sea pressure is connected to the interior of the Bourdon tube to establish the initial, bottom pressure while the exterior of the Bourdon tube is exposed to oil which is maintained at ambient pressure by connection to an oil filled bag exposed to sea pressure.

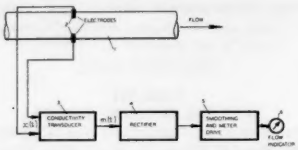
3,820,392
MEASUREMENT OF FLOW IN A HYDRAULIC SYSTEM

Maurice Sidney Beck; George Calvert, both of Ilkley; Patrick John Mendies, Bradford, and Malcolm Cunliffe, Haydock, all of England, assignors to Fielden Electronics Limited, Lancashire, England

Filed Apr. 17, 1972, Ser. No. 244,688
Claims priority, application Great Britain, Apr. 15, 1971, 9550/71
Int. Cl. G01f *1/04*
U.S. Cl. 73—194 E **7 Claims**

A method of on-line measurement of mass flow of the discontinuous phase in a conductive liquid mixture conveying system, comprising the steps of measuring the electrical conductivity between at least one pair of electrodes in contact with the flow stream, deriving a signal representative of the variations of conductivity due to changes in the ratio of the

constituents of the mixture or their relative disposition in the conducting path of the electrodes in the stream from the measurement, rectifying the signal, smoothing the signal and displaying or recording the rectified smooth signal in terms of mass flow measurement.



3,820,393

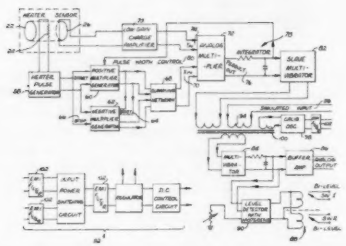
SIGNAL VELOCITY MEASUREMENT SYSTEM

Richard D. McGunigle, 632 Lemon Hill Ter., Fullerton, Calif.

Filed Dec. 9, 1970, Ser. No. 96,511

Int. Cl. G01p 5/10

U.S. Cl. 73—204 **8 Claims**



A correlation system for measuring the velocity of a signal. The principles are applicable to measure the time of flight of any signal. In a specific embodiment, a flowmeter for a fluid stream is described which measures the time of flight of a thermal pulse by correlation of generating and sensing signals. A heater pulse triggers a pulse of controllable duration which controls the polarity of an amplifier connected to a thermal sensor and whose integrated product is utilized to vary the duration of the positive pulse until a null average output is achieved. The control voltage drives a slave multivibrator, the integrated output of which is linearly related to flow and directly indicates the rate of flow of the fluid.

3,820,394

SCALLOP MEASURING DEVICE

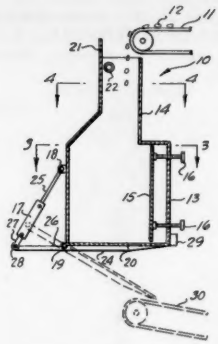
Roger C. Martin, Cocoa Beach, Fla., assignor to Edgar E. Griffis, Brevard County, Fla.

Filed Oct. 13, 1972, Ser. No. 297,312

Int. Cl. G01f 1/00

U.S. Cl. 73—223 **4 Claims**

As the first step in processing scallops, a conveyor belt feeds the scallops, still in their shells, into a container having a movable baffle therein for varying the volume thereof. The container comprises a narrow neck portion within which is disposed an electric eye device. The sensitivity of the electric eye is adjusted so that a single scallop falling past it will not trigger the circuit. When a sufficient quantity of scallops have been fed to the container so that the neck portion thereof is filled, the electric eye light beam is broken, deactivating the electric circuit driving the conveyor belt. At the same time, a piston is actuated to open a hinged door disposed in the bottom of the container, discharging the predetermined quantity of scallops on to a conveyor belt for further processing. After a suitable adjustable time delay in the electric eye circuit, the piston closes the door and advances a counter one digit. The conveyor belt feeding the scallops into the container is again energized and the cycle repeated.



3,820,395

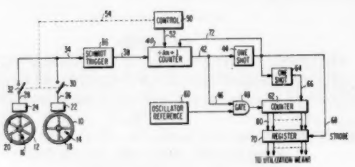
FLOWMETER

Robert Edward Hartwell, 10 Parlee Rd., Chelmsford, Mass. 01824

Filed May 1, 1972, Ser. No. 249,343

Int. Cl. G01f 1/10

U.S. Cl. 73—231 R **5 Claims**



A flowmeter is provided for accurately measuring the flow rates of slow moving fluids in a short time duration from the start of the measurement by determining the actual time interval for one or more integral revolutions of a turbine disposed in the fluid and measuring that time interval by means of a clock and counting device.

3,820,396

FLUID-SIGNAL INDICATOR

Abram Yakovlevich Gamer, Minsk, ulitsa Kakhovskaya, 34, kv. 61, and Efim Mikhelevich Shandalov, Minsk, ulitsa Promyshlennaya, 14, kv. 1, both of Minsk, U.S.S.R.

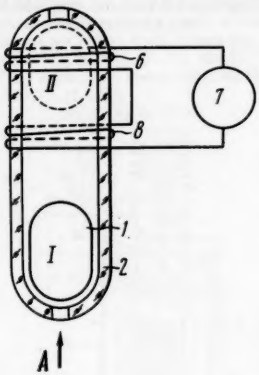
Continuation of Ser. No. 136,522, April 22, 1971. This application Nov. 10, 1972, Ser. No. 305,503

Int. Cl. G01f 23/10

U.S. Cl. 73—308 **3 Claims**

A fluid-signal indicator in which a movable element placed inside a transparent guide tube is made in the form of a transparent capsule filled with an inert gas.

The indicator has a device to set up an r.f. field encompassing the guide tube or a high-potential field inside the tube,



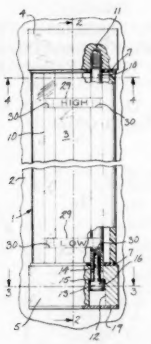
so that when the applied fluid signal displaces the capsule in the guide tube, the capsule finds itself in the zone of the field which causes the gas in the capsule to glow.

3,820,397

LIQUID LEVEL GAUGE

Frank J. Lyden, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowac, Wis.

Filed July 21, 1972, Ser. No. 273,987
Int. Cl. G01f *23/02*
U.S. Cl. 73—328 **6 Claims**



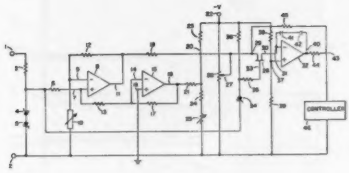
The disclosed liquid level gauge includes an assembly of opposied hollow end members having a tubular sight member interposed therebetween and communicating therewith. The assembly is secured together by means disposed within the sight member and connecting the opposed end members. In serivce, fastener means connect at least one of the end members to a tank for mounting the gauge onto the tank and placing the liquid contents of the tank in communication with the sight member.

3,820,398

SYSTEM FOR PROVIDING A LINEAR OUTPUT FROM A NON-LINEAR CONDITION RESPONSIVE DEVICE

Andre Rekai, Scarborough, Ontario, Canada, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 9, 1973, Ser. No. 349,527
Int. Cl. G01n *25/56*
U.S. Cl. 73—336.5 **8 Claims**



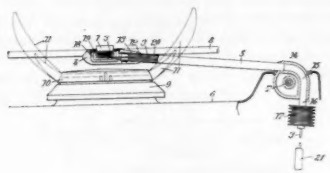
A system, for linearizing an output signal derived from a condition sensing device wherein the reciprocal of the sensor resistance, i.e., the conductance of the sensor, varies linearly according to the changes in the sensed condition, comprises an amplifier having two input terminals and an output terminal, a constant voltage source connected to one of said input terminals, a condition sensing device of the aforesaid nature connected to the other of the input terminals, and a feedback resistor connected between the output terminal and the input terminal to which is connected the condition sensing device such that the amplifier supplies a substantially constant voltage to the humidity sensing device and varies its output in accordance with the linear conductance change of the sensor.

3,820,399

THERMOSTATIC CONTROL OF VESSELS SUBJECTED TO HEATING

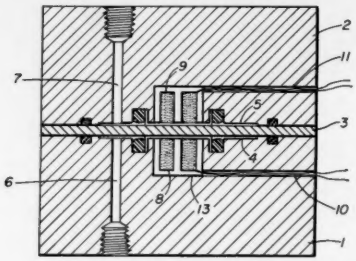
Jean-Bernard de Gouville, Veigne pres Montbazon, France, assignor to Etablissements Sourdillon, Matricage et Roblineberie De Precision, Veigne pres Montbazon, France

Filed Jan. 31, 1972, Ser. No. 221,932
Claims priority, application France, Feb. 2, 1971, 71.3496
Int. Cl. G01k *5/08*; **F23n** *1/00*
U.S. Cl. 73—368 **9 Claims**



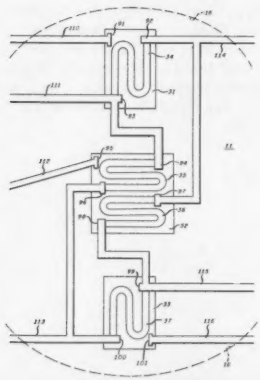
A sensor is borne by a head extended by a metallic arm which passes through the flame of the burner. To avoid exaggerated heating effect on the capillary tube communicating the sensor to the thermostatic control, it is surrounded by a sheath of highly conductive metal. This sheath ends in a tube of the same metal which can be extended by a radiator. In this way, the conductive sheath constitutes a heat pump removing heat to the outside. The head can be protected on the inside by a layer of insulating material. The device is particularly useful for domestic gas cookers.

3,820,400
SEAL
John B. Rosso, Tulsa, Okla., assignor to Combustion Engineering, Inc., New York, N.Y.
Filed Feb. 20, 1973, Ser. No. 333,832
Int. Cl. G01l 9/10
U.S. Cl. 73—398 R 4 Claims



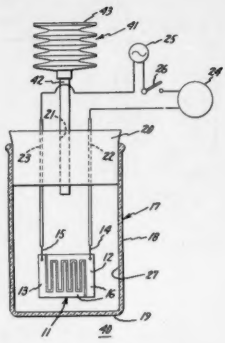
A metallic diaphragm sandwiched between opposed faces of two massive blocks is exposed to differential fluid pressures. Electromagnetic coils are mounted in recesses in the opposed faces of the blocks so that their reluctance is changed by deflection of the diaphragm. The coils are isolated from the fluid by a sheet of impervious material sealed into a recess, or groove, about each coil with a body of O-ring form.

3,820,401
PIEZORESISTIVE BRIDGE TRANSDUCER
Edward T. Lewis, Sudbury, Mass., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Nov. 7, 1972, Ser. No. 304,422
Int. Cl. G01l 1/22
U.S. Cl. 73- 398 AR 12 Claims



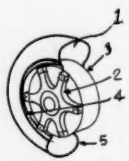
A temperature stable piezoresistor bridge is diffused into the surface of a pressure sensing semiconductor diaphragm formed integrally with a semiconductor body, the diaphragm and body together defining a cavity within the miniature unitary pressure-responsive transducer. Diffused isolation fields and diffused resistors generated at the surfaces of the fields form the piezoresistor bridge on a first semiconductor wafer having a given crystallographic orientation, which structure is then provided with electrically isolated conductors. The first wafer is then bonded to a second wafer of similar material and similar crystallographic orientation for fully defining the cavity element.

3,820,402
ELECTRICAL PRESSURE TRANSDUCER
Leonard V. Interrante, Schenectady, and Stephan P. Mitoff, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Mar. 20, 1973, Ser. No. 343,137
Int. Cl. G01l 9/02
U.S. Cl. 73—398 AR 5 Claims



An electrical pressure transducer is described which responds to total pressure changes by variations in relative humidity changing the electrical impedance of a humidity sensing element. The pressure transducer has a sensing element which is sensitive to relative humidity, an enclosure surrounding the sensing element, a pair of electrical leads extending outwardly from the enclosure, a gas with a relative humidity within the enclosure, and pressure means associated with the enclosure to change the volume of the confined gas thereby varying the relative humidity of the gas.

3,820,403
HUB AND DRUM BALANCING MACHINE
Lloyd G. Thompson, 725 E. Kennedy Blvd., Tampa, Fla. 33602
Filed Jan. 15, 1973, Ser. No. 323,902
Int. Cl. G01m 1/12
U.S. Cl. 73—480 2 Claims

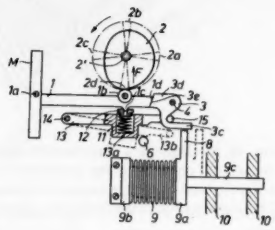


A balancing machine for hubs, brake drums and other rotating members which utilizes needle bearings and a vibrating support structure to reduce balancing errors caused by friction and a balancing method which requires separate balancing of the hub and brake drum as a part of the balancing of entire wheel assembly.

3,820,404
DEVICE FOR TEMPORARILY SECURING AGAINST MOTION A MOVABLE ELEMENT WHICH IS RESILIENTLY BIASED AGAINST A WITHDRAWABLE ABUTMENT

Lucien Alessio, Bourg-les-Valence; Michel Chabanis, Chabeuil; Claude Feraud, and Noel Sarret, both of Valence, all of France, assignors to Crouzet, Paris, France

Filed Nov. 9, 1972, Ser. No. 304,987
Claims priority application, France, Nov. 16, 1971, 71.41232, France, Dec. 9, 1971, 71.44576
Int. Cl. G05g 17/00
U.S. Cl. 74—2 11 Claims

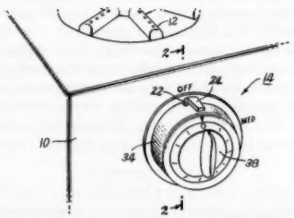


A device for temporarily securing against motion a movable element which is resiliently biased against a withdrawable abutment, said device comprising resiliently yieldable means interposed between the movable element and a movable bearing member, said bearing member being maintained in a position corresponding to the compression of said resiliently yieldable means, by retaining means which are subjected to the action of resiliently yieldable means which tend to cause the retaining means to release said member and to locking means which lock the retaining means in a position in which the resiliently yieldable means interposed between the movable element and the bearing member are compressed.

3,820,405
GAS RANGE TIMER CONTROL

Young C. Hong, 41-11 Parsons Blvd., New York, N.Y. 11355

Filed Jan. 4, 1973, Ser. No. 320,973
Int. Cl. G05g 17/00
U.S. Cl. 74—3.5 2 Claims

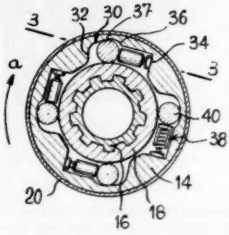


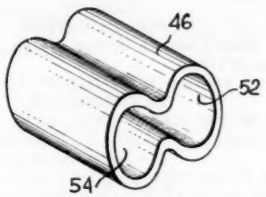
An automatic timer for a gas range control arm which replaces the conventional range knob on the outside of the range. The arm is employed to turn on the range and set its temperature to the desired level. Timer mechanism is employed to turn off the range automatically by means of the arm after a desired time interval has elapsed.

3,820,406
STARTER DRIVE FOR INTERNAL COMBUSTION ENGINES

Pierre Toulier, Ville D'Avray, France, assignor to Societe Anonyme D.B.A., Clichy, France

Filed Dec. 20, 1972, Ser. No. 316,790
Claims priority, application France, Dec. 29, 1971, 71.47230
Int. Cl. F02n 15/00
U.S. Cl. 74—6 1 Claim





A starter drive for an internal combustion engine, in which an overrunning clutch comprises an annular driving member capable of being driven by a starting motor, this member being concentric with and around a driven member attached to a pinion capable of drivingly engaging an engine which is to be started, the clutch further comprising a series of rollers housed in recesses formed in the driven member, each roller bearing both on a cylindrical surface of the driven member and on a cam surface in the bottom of one of said recesses, and each roller being biased by a spring wedging mechanism. In this starter, the wedging mechanism comprises two or more springs arranged in parallel between the roller and one wall of the recess, these springs being coil springs having circular turns and forming a group of thrust members substantially equispaced over the length of the roller. The thrust thus exerted on the roller is more evenly distributed than by means of known wedging mechanisms which include a single spring having a rectangular cross-section.

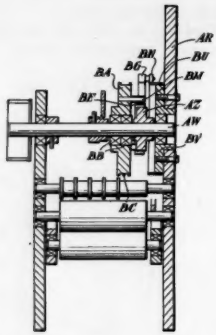
3,820,407
CLUTCH MECHANISMS

John H. Streeter, Berkhamsted, and Roger M. Jenkins, Hitchin, both of England, assignors to Revenue Systems Limited, Harpenden, England

Filed Nov. 14, 1972, Ser. No. 306,281
Int. Cl. F16h 27/00
U.S. Cl. 74—112 11 Claims

The invention relates to clutch mechanisms for converting the continuous rotation of a drive shaft to intermittent or oscillatory motion of a driven member. The drive shaft carries a clutch drum surrounded by a clutch drive fixed at one end to a pin on the driven member. The other end of the clutch band is secured to a pivoted operating lever also mounted on the

driven member. A cam follower mounted on the operating lever co-operates with an arcuate cam surface coaxial with the



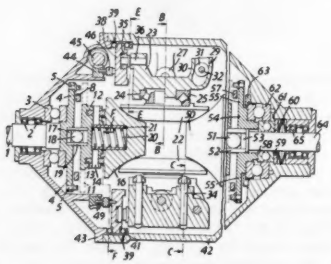
driven member to maintain the lever in a position in which it tightens the clutch band around the clutch drum while the driven member rotates through a predetermined angle.

3,820,408

SPEED VARIATORS

Gerard Alexis Louis, 16, Avenue Anatole, Clichy-sur-Seine, France (92110)

Filed Apr. 12, 1971, Ser. No. 118,235
Int. Cl. F16h *15/08*
U.S. Cl. 74—200 **6 Claims**



In a stepless variator of speed comprising tilting discs in contact under pressure with two coaxial curvilinear respectively driving and driven cone and in view to obtain in all cases better mechanical efficiency: a system of guiding for the tilting movement of a disc formed of three couples of contacting cams, one of each couple fixed the other solidary with the support of the disc; a device to obtain exactly equal speeds at the points of contact of the discs and the cones and the combination of two thrust supporting systems for the exit cone one of which supporting a load only above a given value of the thrust.

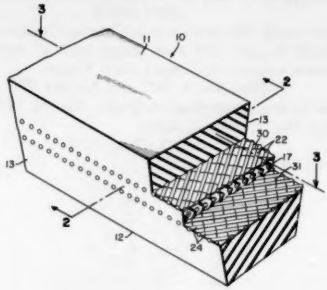
3,820,409

ENDLESS POWER TRANSMISSION BELT

Roger D. Meadows, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed May 2, 1973, Ser. No. 356,680
Int. Cl. F16g *5/16*
U.S. Cl. 74—233 **17 Claims**

A V-belt having a compression section, a tension section, and a longitudinally extending load-carrying cord arranged in a layer between said sections and wherein such belt has a plurality of closely spaced supporting cords arranged transverse to and on at least one side of the load-carrying cord and means holding the supporting cords parallel yet allowing free flexing



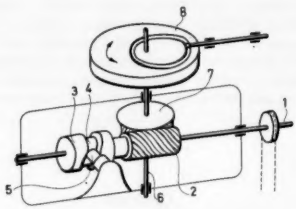
movements of the belt in a direction perpendicular to the parallel transverse cords with the transverse cords providing crosswise rigidity and side edge support enabling the belt to be operated efficiently under comparatively high tension loads.

3,820,410

VARYING VELOCITY GEARING

Agoston Sarlos, Budapest, Hungary, assignor to Lampart, Budapest, Hungary

Filed Mar. 29, 1973, Ser. No. 345,989
Int. Cl. F16h *35/02*
U.S. Cl. 74—393 **5 Claims**



Gearing, more particularly apparatus for producing different straight line, or rotary, continuous, or periodical motions of uniform, or varying velocity. The apparatus comprises a first, axially moving gear element on a driving shaft, said first gear element meshing with another, second gear element on a driven shaft. The first gear is preferably a worm or a helical gear with teeth disposed at an angle with respect to the axis of the driving shaft. Said axially movable first gear element is preferably equipped with a cam meshing with a cam follower which is stationary with respect to the housing of the apparatus. The axially movable first gear element may also be reciprocated by a crank drive or an eccentric mechanism.

3,820,411

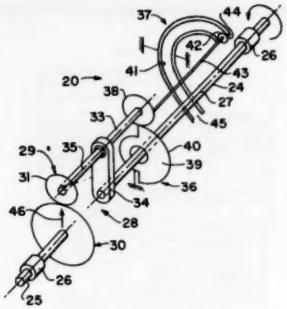
IN-LINE, POSITIVE DRIVE, INDEXING UNIT

Rome R. Rudolph, 4113 Lee Rd., Gibsonia, Pa. 15044

Continuation-in-part of Ser. No. 224,753, Feb. 9, 1972, abandoned. This application Apr. 5, 1973, Ser. No. 348,105
Int. Cl. F16h *35/02*
U.S. Cl. 74—394 **16 Claims**

An indexing unit having coaxial input and output shafts arranged for individual rotation about a common first axis. The shafts are connected by a positive drive train which includes output gear means rotatable with the output shaft; and plane-

tary gear means supported by the input shaft for revolution therewith about the common first axis and in meshing relation with the output gear means. Dwell means is provided for maintaining the output shaft stationary during a selected arc segment of revolution of the input shaft. Indexing means is provided for rotating the output shaft through a selected indexing angle during the remaining arc segment of revolution of the input shaft. The indexing means provides controlled acceleration and deceleration of the output shaft during the initial and end portions of the indexing period.



3,820,412

ADVANCING DRIVE FOR SLIDES ON MACHINE TOOLS

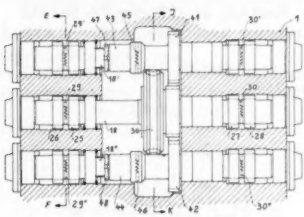
Alois Moosmann, 11, Muttergartenwey, Stuttgart-Birkach, Germany

Filed Dec. 19, 1972, Ser. No. 316,471

Claims priority, application Germany, Dec. 20, 1971, 2163242

Int. Cl. F16h *1/04*

U.S. Cl. 74—422 **8 Claims**



An advancing drive for slides and carriages on machine tools in which the slide is carried by rolling bodies on guide rails, comprises a pinion which is mounted on a drive shaft and engages a rack. At least one guide rail is constructed as a rack and its teeth are engaged by the drive pinion.

3,820,413

METHOD AND APPARATUS FOR POWER TRANSMISSION UTILIZING A WORM DRIVE

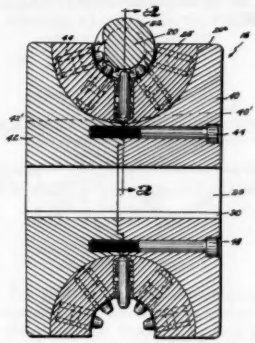
George E. Brackett, Apt. 241-A Condo 7 Heritage Village, Southbury, Conn. 06488

Filed Dec. 14, 1972, Ser. No. 315,090

Int. Cl. F16h *1/16, 1/06, 55/06*

U.S. Cl. 74—425 **7 Claims**

A worm drive for power transmission combines a worm screw with a worm wheel comprising an annular body having a concaved outer peripheral surface. A multiplicity of roller members are located in roller retaining sockets formed in said outer concaved peripheral surface and arranged in a series of spaced apart rows. Each of the roller members is positioned in a manner such that its central axis of rotation extends radially inwardly in relation to the central axis of the rotation of the worm screw. Rolling engagement of successive roller surfaces with the worm screw threads provides a highly efficient, substantially non-friction-loss drive.



3,820,414

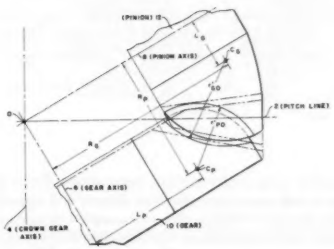
GEAR TOOTH DESIGN

Meriwether L. Baxter, Jr., Brighton, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Continuation-in-part of Ser. No. 274,157, July 24, 1972, abandoned. This application May 3, 1973, Ser. No. 357,036

Int. Cl. F16h *55/06, 1/14*

U.S. Cl. 74—462 **11 Claims**

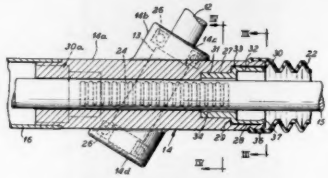


A new gear design providing increased load-carrying ability while being particularly adaptable to manufacture by lower-cost forming methods with powder metal or plastic materials. The teeth of the gears are unconventional in appearance, having a generally elliptical face outline formed by oppositely curved root and topland lines so that the height of each tooth face is maximum at midpoint and reduces substantially to zero at the length extremeties. The teeth are substantially inclined to the pitch line and each gear has a large and small end, the tooth slots being invisible when the finished gear is viewed along its axis from the large end. The disclosure includes constructions and calculations for designing conjugate pairs of such unconventionally-shaped gears having preferred running characteristics.

3,820,415
RACK AND PINION ASSEMBLY

Richard Cass, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 1, 1973, Ser. No. 337,120
Int. Cl. B62d *1/20*; **F16h** *55/18*
U.S. Cl. 74—498 **17 Claims**

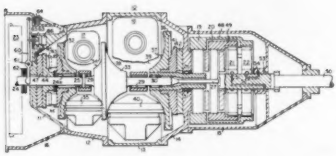


Rack and pinion assemblies, especially for automotive steering gear, having an adjustable rack bar mounting in the pinion housing with an eccentric portion on the side of the rack bar opposite the toothed rack portion thereof to bias the rack bar toward the pinion. The mounting may be locked in fixed position after the desired bias has been developed or it may be spring loaded to provide a wear take-up feature for maintaining the rack and pinion teeth in fully meshed engagement as wear develops.

3,820,416
VARIABLE RATIO ROTARY MOTION TRANSMITTING DEVICE

Charles E. Kraus, Austin, Tex., assignor to Excelermatic, Inc., Leesburg, Pa.

Filed Jan. 5, 1973, Ser. No. 321,452
Int. Cl. F16h *15/08, 37/06*
U.S. Cl. 74—690 **6 Claims**



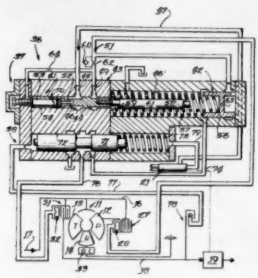
A variable ratio rotary motion transmitting device having a toric input and output traction disc disposed at opposite sides of an intermediate traction disc and coupled to input and output shafts. The intermediate traction disc has a toric surface formed at each side corresponding to the toric surfaces formed on the facing input and output traction discs. Motion transmitting means are disposed between the output and input traction discs and the intermediate traction disc and engage the toric surfaces at variable circles of contact.

3,820,417
CONTROLS FOR SEQUENTIALLY ENGAGING TRANSMISSION, TORQUE CONVERTOR LOCK-UP AND MASTER CLUTCHES

Thomas E. Allen, Mustang, Okla., and Shairyl I. Pearce, East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 10, 1972, Ser. No. 279,686
Int. Cl. F16d *39/00*; **F16h** *45/02*
U.S. Cl. 74—733 **22 Claims**

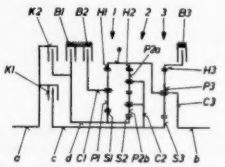
A clutch control system for a drive train having an input clutch arranged between a prime mover and the impeller element of the torque converter, hydraulically operable transmission means being coupled with the turbine element of the torque converter, the clutch control system including an input clutch control valve associated with the transmission means for causing engagement of the input clutch subsequent to substantial engagement of the transmission means, the input clutch control valve having a delayed response to fluid pressure from the transmission means to insure engagement of the input clutch subsequent to the transmission means and an accumulator for controlling the rate of pressure rise in the input clutch. One embodiment of the invention also includes a lock-up clutch for selectively engaging the prime mover with the turbine element and the transmission means, a lock-up clutch control valve being included in the clutch control system for sequencing operation of the lock-up clutch relative to the input clutch.



3,820,418
PLANETARY-GEAR TRANSMISSION FOR AUTOMOTIVE VEHICLES

Anton Ott, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengeselischaft, Friedrichsfafen, Germany

Filed Aug. 21, 1972, Ser. No. 282,552
Claims priority, application Germany, Aug. 19, 1971, 2141563
Int. Cl. F16h *57/10*
U.S. Cl. 74—759 **4 Claims**



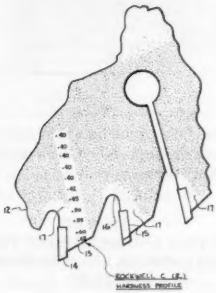
An automotive transmission has three cascaded planetary gear trains, the first two gear trains having two interconnected or unitary sun gears and further having two interconnected or unitary ring gears rigid with the planet carrier of the third gear train and with an output shaft. A first clutch K1 connects an input shaft with the second planet carrier in any of four forward speeds while a second clutch K2 connects that shaft with the two paired sun gears in fourth gear (direct drive) and in either of two reverse speeds. Three brakes B1, B2, B3 serve to arrest the two paired sun gears, the first planet carrier or the third ring gear. The first planet carrier supports one set of planet gears whereas the second planet carrier supports two sets of planet gears meshing with each other.

3,820,419

METHOD OF REDUCING STRESS CONCENTRATION AND CRACKING FAILURES IN CARBIDE TIPPED SAWS

Erman R. McLagan, Corvallis, Oreg., assignor to The McLagan Co., Corvallis, Okla.

Continuation-in-part of Ser. No. 223,987, Feb. 7, 1972, abandoned. This application Aug. 8, 1973, Ser. No. 386,832
Int. Cl. B23d 63/00
U.S. Cl. 76—112 5 Claims



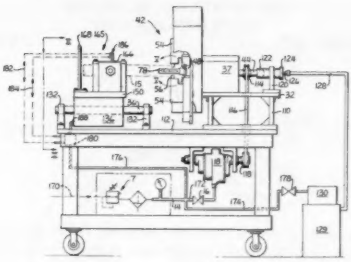
Stress concentration and cracking failures in the tooth and gullet regions of carbide-tipped saws are eliminated by heating the saw after the carbide tips have been silver soldered thereto to a temperature above the temperature at which the plate hardness is reduced to a hardness at which glass bead peening can achieve penetration of the surface metal and then simultaneously glass bead peening the edge and opposite sides of the saw in the peripheral region thereof.

3,820,421

APPARATUS FOR SKIVING AND CLEANING REINFORCED HOSE

Michael L. Anderson, Marquette Heights; Harold Wayne Fowler, Brimfield, and David Alexander McKie, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed July 12, 1973, Ser. No. 378,718
Int. Cl. B23b 5/00, 3/22
U.S. Cl. 82—20 16 Claims



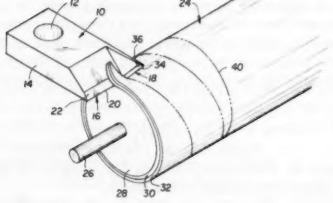
Apparatus for simultaneously cleaning and skiving reinforced hose including vacuum means for removing particulate matter from the interior of the hose. Rotating cutter means are provided for skiving an exterior covering layer from said hose. The hose is mounted in longitudinally moveable clamping means and fed into the longitudinally fixed rotary cutters and vacuuming means.

3,820,420

CUTTING BLADES FOR CABLES AND METHOD THEREFOR

James J. Matthews, East Haddam, Conn., assignor to Utility Tool Corp., East Haddam, Conn.

Continuation of Ser. No. 114,778, Feb. 12, 1971, abandoned. This application Mar. 28, 1973, Ser. No. 345,776
Int. Cl. H02g 1/12
U.S. Cl. 81—9.5 R 10 Claims



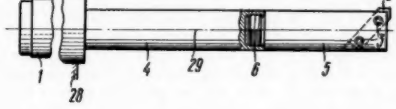
Cutting blades for severing covering material from electric cables and the like in which the blades have two cutting elements forming an intersection at which the covering material is severed, the blades include a cutting edge and a surface to lift the covering material from the cable and cutting edge and surface to cut the covering material substantially axially with the covering material being severed at the intersection.

3,820,422

CANTILEVER TOOL MANDREL

Evgeny Izrailevich Rivin, ulitsa Vanvilova 70, Korpus 3, kv. 177, and Jury Emanuilovich Lapin, Leninsky prospekt, 99, Korpus 115, kv. 10, both of Moscow, U.S.S.R.

Filed May 29, 1973, Ser. No. 364,403
Int. Cl. B23b 29/02
U.S. Cl. 82—36 R 1 Claim



A cantilever tool mandrel applied to machining long openings in metals and other materials. It consists of at least two portions: the portion which is adjacent to the fastening place of the mandrel and the portion adjacent to the tool head located on the loose end of the mandrel and carrying the cutter. These portions are fabricated from materials with different moduli of elasticity and densities: the material for the portion adjacent to the fastening place of the mandrel should have a modulus of elasticity which is at least, 1.5 times higher than that of the material for the other portion. The density of the latter should be at least 1.5 times lower than that of the

material of the former portion. The length of each portion of the mandrel is from 40 to 60 percent of the total length of the mandrel.

3,820,423
METHOD FOR CONDITIONING CANS

Stanley J. Miller, Chicago, Ill., assignor to National Can Corporation, Chicago, Ill.

Division of Ser. No. 81,872, Oct. 19, 1970. This application Apr. 9, 1973, Ser. No. 348,932
Int. Cl. B23b *1/00, 3/04*
U.S. Cl. 82—47 **9 Claims**

LEFT VIEW POSITION
CUTTER (FORWARD) THRU HOLE AND INTO CAN
CUTTER RETRACTED
CAM FORWARDS SHELL POSITION
CUTTER IN CUTTING SHELL POSITION
CUTTER RETURNS TO RETRACTED POSITION
UNLOAD CAN POSITION
CUTTER RETURNS TO ENTER THRU HOLE

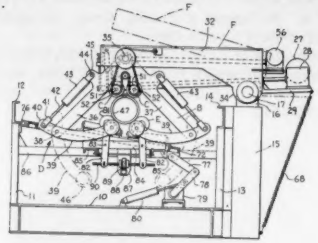
A method for trimming salvage edges from container ends by axially inserting a cutter into the open end of a container surrounded by a backing member, shifting the cutter transversely of the longitudinal axis of the container and producing relative rotation between the cutter and container to trim salvage edges from the inside to the outside of the container. The apparatus for trimming salvage edges includes an elongated member rotated about an axis and having a plurality of circumferentially spaced trimming stations. Each of the trimming stations includes a fixed backing member having an opening, a container support movable between first and second positions on one side of the backing member, and a cutter supported eccentrically of a shaft on the opposite side of the backing member with the shaft being movable transversely and axially to temporarily align the cutter with the axis of the opening, and position the cutter inside the container in engagement with the container wall so that rotation of the shaft will trim the salvage edge. The cutter is designed to automatically produce an arcuate surface on the inner edge of the container wall during the cutting operation. Camming members cooperate with the shaft and the container support to move the shaft and container support to the various positions during each cycle of rotation of the elongated member.

3,820,424
PIPE CUTTER

John S. George, Jr., 313 Bethel Dr., Mauldin, S.C. 29662

Filed Oct. 17, 1972, Ser. No. 298,283
Int. Cl. B23b *3/04*
U.S. Cl. 82—101 **4 Claims**

A pipe cutter for cutting pipes which includes a rotatable cutter head. Pivotal arms engage the pipe for holding the pipe in contact with the cutter head. Drive rollers rotate the pipe so that such can be cut circumferentially therearound. The pipe

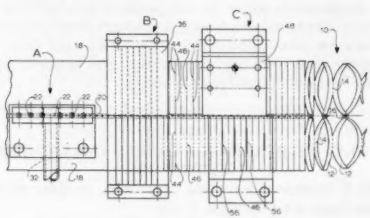


is fed under the cutting head on a conveyor which is hinged so that such can be lowered. When the conveyor is lowered the pipe is supported on support rolls.

3,820,425
APPARATUS AND METHOD OF PRODUCING SCRAPLESS CARRIER DEVICES FROM A SIAMESE TUBE

Ernest R. Cunningham, Libertyville, Ill., assignor to Grip-Pak, Inc., St. Louis, Mo.

Filed Dec. 13, 1972, Ser. No. 314,867
Int. Cl. B26d *3/00*
U.S. Cl. 83—7 **7 Claims**



Apparatus and method of forming a scrapless multi-packaging device from at least one elongated flattened tube of stretchable and elastic plastic material having upper and lower wall sections is disclosed as including the means or procedural steps of forming a plurality of transverse parallel slits throughout the upper and lower wall sections of the tube except at generally opposite connecting webs in each of the upper and lower wall sections, and thereafter cutting alternate connecting webs in the upper and lower wall sections of the tube to provide an interconnected series of flattened material bands defining the scrapless multi-packaging device.

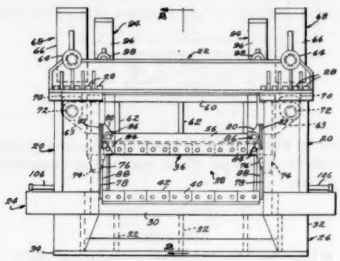
3,820,426
WIDE THROAT SCRAP SHEAR

Wallace M. Thompson, Cordele, Ga., assignor to Harris Press & Shear Corporation, Cordele, Ga.

Filed Oct. 24, 1972, Ser. No. 299,798
Int. Cl. B26d *1/06*
U.S. Cl. 83—13 **13 Claims**

A scrap metal shear has the opposite ends of its crosshead slidably guided, which carries a straight cutting blade cooperating with a horizontal fitted blade, for vertical movement and pivotally connected to depending hydraulic rams which, in turn, are pivotally mounted on the shear frame so that either end of the crosshead may be moved up or down relative to the other end by differential operation of the rams

and the crosshead may be translated vertically while in an angular position to the horizontal by operation of both rams in



unison. The shear also includes a hold-down device or clamp member mounted and operable by another set of rams similar to the mounting and operation of the crosshead.

3,820,427

METHOD AND DEVICE FOR CUTTING SPLIT FILM

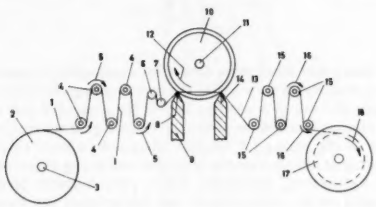
Joannes Gerardus Stomph, Maasland, Netherlands, assignor to Nederlandse Organisatie Voor Tolgepast-Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer, The Hague, Netherlands

Filed Sept. 1, 1972, Ser. No. 285,752

Claims priority, application Netherlands, Sept. 14, 1971, 7112613

Int. Cl. B26d *7/14*

U.S. Cl. 83—18 **5 Claims**



To cut split film into narrow strips, the film while being kept under considerable longitudinal stress is fed over a sharp edge and a number of parallel rotating circular knives which have a small fold angle and the cutting edges of which intersect the plane of the film under an acute angle closely behind the said sharp edge.

3,820,428

METHOD AND APPARATUS FOR PRODUCING WEIGHT CONTROLLED GROUPS OF SLICED FOOD PRODUCT

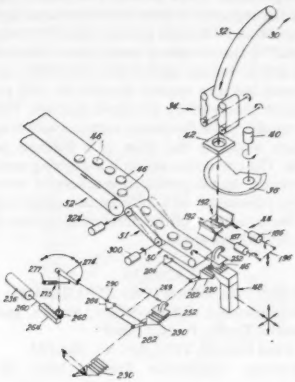
Robert Howard Marshall, Hinsdale, and Gary Leonard Wallace, Oak Lawn, both of Ill.

Filed Sept. 28, 1972, Ser. No. 293,669

Int. Cl. B26d *5/00, 7/00*

U.S. Cl. 83—38 **26 Claims**

A method and apparatus for producing weight controlled stacks of counted slices cut from an elongated mass of food product includes means for feeding the mass longitudinally along a downward feed path into a cutting path normal thereto, a rotary knife movable around the cutting path to cut slices from the mass, means below the cutting path for accumulating a selected number of the slices into a group, means positioned below the accumulating means for weighing a group of slices and producing a signal in response to the weight thereof, means for removing the group from the weighing means after the signal is produced, means for varying



the rotary speed of the knife around the cutting path according to the weight signal, and means for accepting or rejecting weighed groups in response to the weight signal.

3,820,429

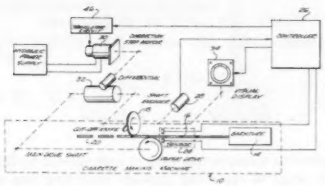
PREPRINTED CIGARETTE PAPER REGISTRATION CONTROL

Richard C. Harris, Jr., Middletown, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Dec. 20, 1972, Ser. No. 316,679

Int. Cl. B26d *5/32*

U.S. Cl. 83—76 **5 Claims**



In the manufacture of cigarettes utilizing paper having registration marks at spaced intervals, the paper is fed at a constant speed with constant tension while the cigarette cutoff knife speed is varied and consequently the distance between knife cuts to accommodate the presence of varying repeat lengths of paper between registration marks. The registration control circuitry increases the knife speed if the registration mark leads the knife cut, and the knife speed is decreased if the registration mark lagged. An optical sensor senses the registration mark on the paper at a location prior to cutting. A shaft encoder transforms analog mechanical rotation of the cutoff knife into electrical pulses. The output of the encoder is in the form of a pair of pulses one for each knife revolution while the other is in the form of 500 pulses per knife revolution. Both of these outputs are applied to the enable pulse detector circuit of a controller. One of the 500 pulses per knife revolution is chosen as an enabling or start pulse to be applied to a pulse forming circuit. The one pulse per knife revolution output of the encoder resets counters of the enable pulse detector circuit to zero with each revolution. The pulse forming circuit has two inputs including the 500 pulses per knife revolution from the shaft encoder and the enable pulse from the enable pulse detector. The pulse forming circuit produces four outputs including a lead pulse, lag pulse, pulses to a visual indicator, and a knife pulse. The registration mark sensor produces a very narrow output pulse which is applied to the visual indica-

tor and a registration detector circuit. This circuit has four input signals, namely, a lead gate pulse, a knife pulse, lag pulse, and registration mark pulse. Four output signals are produced by the registration detector circuit and applied to a correction speed and direction circuit. These four signals are an "automatic" pulse, increase knife speed, decrease knife speed pulse and in register pulse. The correction speed and direction circuit has also applied thereto the 500 pulses per knife revolution produced by the shaft encoder. This circuit produces a variable pulse frequency output which is applied to the correction motor in the form of a forward pulse and reverse pulse. The correction motor is a stepping motor which serves to convert digital pulses to mechanical motion, and consequently, adjustment of a differential coupled to the cutoff knife. The activation of the differential results in adjustment of the cutoff knife speed.

3,820,430

YARN TRANSPORTING APPARATUS

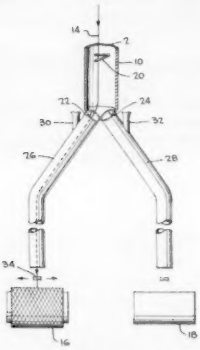
Jean-Claude Hautemont, Gif-sur-Yvette, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed May 29, 1973, Ser. No. 364,423

Claims priority, application France, May 26, 1972, 72.19405

Int. Cl. B65h *29/24*

U.S. Cl. 83—100 **11 Claims**



Apparatus for transporting yarn at high speeds by fluid from a delivery point to receiving stations including one or more delivery conduits receiving yarn from the delivery point, a yarn cutting mechanism for each delivery conduit, distribution conduits communicating with each delivery conduit, each of the distribution conduits being directed toward one of the receiving stations, a nozzle carried by each of the distribution conduits for creating a flow of compressed air in the distribution conduits and a control system for operating the yarn cutting mechanisms and selectively supplying compressed air to the nozzles to control the direction of yarn movement through the distribution conduits from each delivery conduit after actuation of the yarn cutting mechanism.

3,820,431

CONVEYOR HAVING THRUST MEANS MOVABLE IN A SERIES OF DISCRETE STROKES AND PROVIDED WITH AN ABOUTMENT FOR ENGAGING THE REAR END OF AN ARTICLE TO BE FED TO A PREDETERMINED POSITION ON THE CONVEYOR

Carl Ullrich Peddinghaus, Obere Lichtenplatzer Strasse 276, 5600 Wuppertal-Barmen, Germany

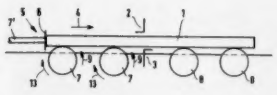
Filed Apr. 3, 1972, Ser. No. 240,747

Claims priority, application Germany, Apr. 17, 1971, 2118652

Int. Cl. B26d *7/16*

U.S. Cl. 83—251 **3 Claims**

A conveyor for use in conveying articles provided with thrust means movable in a series of discrete strokes, with the thrust means having an abutment at one end for engaging the rear end of an article which is to be conveyed and means for applying a force to such an article whereby the rear end of said



article will be brought and/or maintained in engagement with said abutment after said thrust means has completed each feeding stroke.

3,820,432

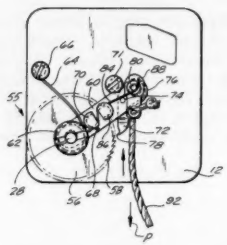
WINDING MECHANISM FOR MUSIC BOX

Harry Fishbein, New York, N.Y., assignor to Swisstone Corporation, New York, N.Y.

Filed Jan. 29, 1973, Ser. No. 327,829

Int. Cl. G10f *1/06*

U.S. Cl. 84—94 **18 Claims**



A music box movement driven by a coil spring is provided with a mechanism for winding the power spring about its arbor without the use of a winding key or an elongated pull cord. The winding mechanism includes a ratchet gear secured to the arbor of the spring for rotation therewith, a lever rotatably mounted at one end on the arbor for oscillating movement in first and second directions, and a pawl member pivotally mounted on the lever adjacent the ratchet gear and having a free end which is adapted to engage the teeth on the ratchet gear upon rotation or movement of the lever in a first direction, thereby to rotate the ratchet gear and arbor in a direction to wind the spring within its housing. In one embodiment the winding mechanism is constructed to permit music to be produced by the music box at all times during the winding.

3,820,433

BUSHING STRUCTURE FOR USE IN PIVOTALLY SUPPORTING THE KEYS OF KEYBOARD MUSICAL INSTRUMENTS

Hajime Hayashida, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed June 7, 1973, Ser. No. 367,715

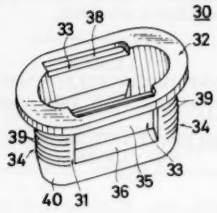
Claims priority, application Japan, June 7, 1972, 47-57171

Int. Cl. G10c *3/12*

U.S. Cl. 84—436 **6 Claims**

Each of the keys of a keyboard musical instrument such as a piano is pivotally supported by a stationary pivot pin inserted with clearance into a slot formed therein. The upper end of the pivot pin projecting from the slot is caught in a slotted plate through a bushing according to the invention. Preferably integrally molded of a synthetic resin, the bushing comprises a hollow body with cross sectional shape conforming to the shape of the slot formed in the plate, and a flange formed on

the upper end thereof. The hollow body is composed of a pair of parallel walls interconnected through arcuate walls at both ends thereof, and at least the middle portions of the parallel walls are made thinner than the other wall portions of the hollow body by forming recesses on the external surfaces of the



parallel walls. The flange is also cut open above the recesses so that the pivot pin, having a diameter greater than the spacing between the parallel walls is securely caught between the middle portions of the parallel walls by causing the same to bulge without correspondingly deforming the flange.

3,820,434

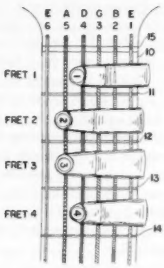
GUITAR INSTRUCTION SYSTEM

Howard M. Roberts, 5002 Wilkinson, North Hollywood, Calif. 91605

Filed June 9, 1971, Ser. No. 151,208

Int. Cl. G10b *15/00*

U.S. Cl. 84—485 **7 Claims**



Disclosed is a combination of coded guitar strings, finger marking devices and notation coordinating the two. The system includes guitar strings each having a distinctive color representative of its fundamental frequency. Disclosed also is a musical notation arrangement coordinated with the color coding of the guitar strings with pressure sensitive labels for adhering to the finger nails of the players, each carrying an indicia representative of the particular finger and coordinated with the notation system. The musical notation system is color coded corresponding to the strings with spacing directly related to musical intervals and numerical or other indicia corresponding to the fingers of the player.

3,820,435

CONFINEMENT SYSTEM FOR HIGH EXPLOSIVE EVENTS

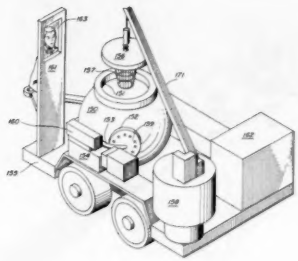
Benjamin T. Rogers, Embudo; Roger W. Taylor, and Douglas Venable, both of Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed May 11, 1972, Ser. No. 252,171

Int. Cl. G01n *33/22*

U.S. Cl. 89—1 R **7 Claims**

A system for completely containing the energy, detonation products, and any other products of an explosive event. In its simplest form, the system comprises a thin-walled confinement vessel, having at least one access port, a closure for the port or ports, a support structure within the vessel for holding the explosive out of direct contact with the vessel wall, and a vacuum system for evacuating the confinement vessel prior to detonation of the explosive. By drawing a 500 micron vacuum within the confinement vessel before detonation, the amount



of explosive for which the energy and products can be completely contained is typically doubled over that which can be contained at atmospheric pressure. One embodiment, useful for high-explosive studies, readily allows flash radiography of an event as it occurs. Another embodiment is particularly useful for the containment and disposal of bombs or other infernal devices.

3,820,436

GUN TURRET, ESPECIALLY FOR ARMORED VEHICLES

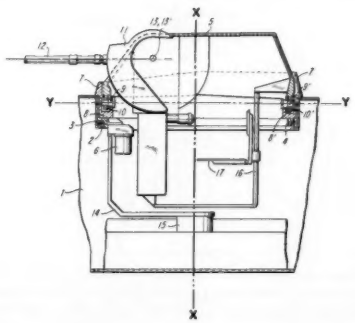
Karl Albert Kohler, Vellmar, Germany, assignor to Rheinstahl Aktiengesellschaft, Essen, Germany

Filed May 30, 1972, Ser. No. 257,616

Claims priority, application Germany, June 1, 1971, 2126679

Int. Cl. F41h *5/20*

U.S. Cl. 89—36 K **2 Claims**



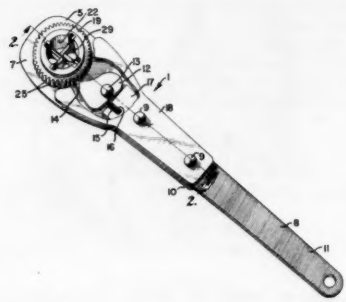
A gun turret, especially for armored vehicles, in which the turret is mounted within the outer shell of the vehicle at the top and is tiltable about an axis parallel to the weapon on an azimuth ring which is rotatably supported in the vehicle. The weapon is tiltable in the turret about an axis extending at right angles to the weapon and which last mentioned axis is offset from the axis of rotation of the azimuth ring in a direction toward the weapon.

3,820,437

TIP DRESSING TOOL

Rex H. Dyer, Independence, Mo., and Lauren W. Burnett, Dubuque, Iowa, assignors to Dyer Weld Tool Corp., Lexington, Mo.

Filed Apr. 17, 1972, Ser. No. 244,369
Int. Cl. B23c 1/20
U.S. Cl. 90—12 1 Claim



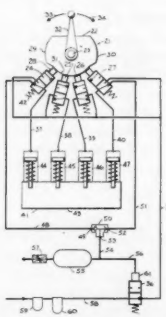
A tool for dressing the electrode tips of spot welding machines includes a body having an aperture therethrough and a handle extending radially from said aperture. A circular dressing head is removably and rotatably received within the aperture and includes peripheral teeth forming part of a ratchet permitting the dressing head to move only in one direction relative to the body. The dressing head contains inwardly projecting cutter members which are sustantially flat near the head center and increase in cutting attack angle radially outwardly so that the electrode tip is dressed while removing a minimum of material therefrom.

3,820,438

NEUTRAL TIME-DELAY FLUID CONTROL CIRCUIT

Jack R. Kobelt, 235 E. 5th Ave., Vancouver, Canada

Filed Mar. 22, 1973, Ser. No. 343,738
Int. Cl. F15b 21/02, 11/00
U.S. Cl. 91—36 11 Claims



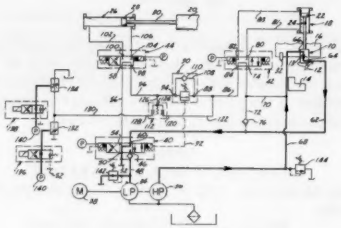
This disclosure pertains to a novel fluid control circuit which provides a neutral time-delay between two modes of operation, such as between forward and reverse in a power transmission system. A control head, having a duality of operational modes, sequentially actuates one or more fluid control valves in either mode. The exhaust port of the first actuated control valve in each mode is duct interconnected by means of a shuttle-valve to a volumetric fluid accumulator, and to the pilot portion of a pilot operated two-position two-way control valve which controls the fluid supply to the fluid control valves in the control head. The accumulator has a variable flow-control exhausting valve whereby a sudden change from one to the other of the operational modes of the control head closes and maintains closed the pilot operated control valve, for an adjustable neutral time-delay period, until the fluid in the accumulator is exhausted.

3,820,439

TRACER CONTROL CIRCUIT FOR MACHINE TOOLS

Sylvester Cudnohufsky, 1290 S. Lake Angelus Dr., Pontiac, Mich. 48055

Filed June 12, 1972, Ser. No. 261,591
Int. Cl. F15b 21/02
U.S. Cl. 91—37 17 Claims



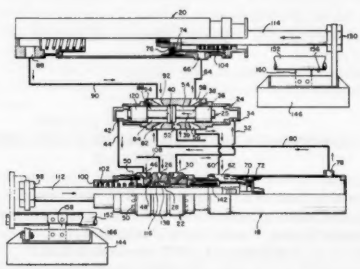
A tracer control circuit for machine tools of the type having two perpendicularly related hydraulic cylinders for controlling longitudinal and transverse feed of a cutting tool. The circuit includes a tracer valve which is variably restricted in accordance with movement of a stylus following a template. The tracer valve is connected to a feed line from a high pressure pump which also extends to one of the cylinders. A feed line from a low pressure pump extends to the other cylinder. The drain lines from both cylinders extend to a stability valve, the outlet of which is connected to sump through a flow control valve for determining the maximum feed rate of both cylinders. The stability valve is designed to respond solely to the volume of flow permitted by the flow control valve to create the necessary pressure drop between the two drain lines to cause the stylus to accurately follow the contour of the template without oscillation.

3,820,440

RECIPROCATING TOOL WITH BALANCED DUAL AIR CYLINDERS

Wallace C. Knapp, 1007 Roxleigh Rd., Towson, Md. 21204

Filed Dec. 11, 1972, Ser. No. 314,161
Int. Cl. F01l 15/00
U.S. Cl. 91—40 13 Claims



A reciprocating tool with balanced dual air cylinders including a pair of opposed piston assemblies and attachments which

continuously move in opposite directions. A reversing pilot valve assembly is provided which is actuated by a drive piston assembly to direct the flow of air to a main reversing valve assembly. The main reversing valve assembly directs the flow of air to the drive and idler dual cylinders for reciprocating tool operation purposes.

3,820,441

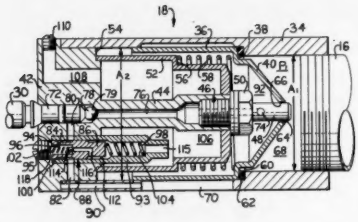
PNEUMATIC STARTER MODULATOR VALVE MEANS INCLUDING LUBRICATING MEANS FOR PNEUMATICALLY DRIVEN MOTORS

Harold L. Ward, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 76,019, Sept. 28, 1970, abandoned. This application Feb. 23, 1973, Ser. No. 335,133

Int. Cl. F01m *1/04*

U.S. Cl. 91—46 **4 Claims**



A compact pneumatic starter modulator including valve assembly means which provides the features and associated functions of actuating, regulating and conditioning pressurized air introduced from an air source to an air driven unit. The actuating feature of the valve assembly employs differentially loaded actuating valve means wherein selectively introducing pressurized air thereto maintains the valve body in the closed position. Trigger means integral with the valve assembly means unbalances the differential loading to open the valve assembly means. Other valve means within the valve assembly means cooperate therewith to provide for regulating the air pressure delivered to the driven unit via the valve assembly means. In addition, third valve means is included within the combination, which integrally cooperates with the regulating valve means, to introduce selectable quantities of lubricating or conditioning fluid to the air delivered to the driven unit via the valve assembly means.

3,820,442

VARIABLE CUT-OFF INTAKE VALVE SYSTEM

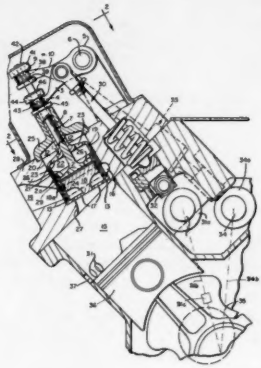
Robert J. Raymond, Watertown, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed May 3, 1972, Ser. No. 249,789

Int. Cl. F01l *31/00*

U.S. Cl. 91—259 **4 Claims**

An intake valve system for fluid pressure expanders wherein two annular and concentric valves are interposed between a source of pressurized working fluid and an expander cylinder and any pressurized working fluid between the valves can enter the cylinder only when both valves are in the open position. The period of one valve being open is fixed and the period of the other valve being open is variable with respect to the angular position of the crankshaft. Each valve can be provided with an opening to permit the pressure exerted by the working fluid to be equalized on opposing valve surfaces. When the valves have these openings, a fixed means within the inner concentric valve prevents pressurized fluid from entering the cylinder when only one valve is in the closed position.



3,820,443

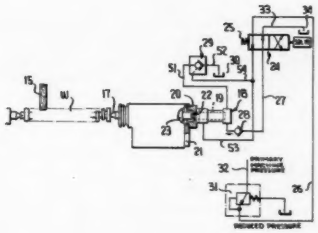
FLUID MEANS FOR LOCKING A MACHINE PART IN WORKING POSITION

Kurt M. Gebel, Waynesboro, Pa., assignor to Landis Tool Company, Waynesboro, Pa.

Filed Aug. 20, 1969, Ser. No. 851,537

Int. Cl. F15b *13/042*

U.S. Cl. 91—420 **6 Claims**



This disclosure relates to a sliding element on a machine, particularly a machine tool, and more particularly, a tailstock for supporting a workpiece during a machining operation. During such a machining operation, the tailstock is subjected to momentary forces in excess and in opposition to the force normally required to hold the tailstock center in contact with the workpiece. The means for holding the tailstock positively against such forces is a body of hydraulic fluid applied to the tailstock center by means of a piston and cylinder. The pressure in the cylinder is only sufficient to hold the piston in contact with the tailstock center, but not sufficient to resist the momentary excessive forces. Such resistance is provided by locking the body of fluid against movement. This is accomplished by one check valve in a line through which fluid is supplied to the head end of the cylinder. Another connection is

provided to the head end of the cylinder which includes a pilot-type check valve for preventing movement of the fluid out of the cylinder during the machining operation, but which may be opened when the tailstock center is retracted to discharge fluid from the head end of the cylinder direct to a reservoir without passing through a reversing or other control valve when the tailstock center is retracted. The pilot-type check valve is located as close as possible to the head end of the cylinder so that practically all of the fluid in the cylinder is discharged direct to the reservoir along with any accumulation of air.

3,820,444

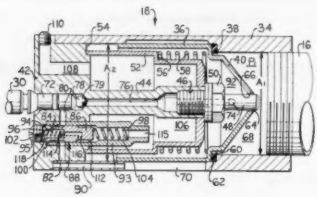
PNEUMATIC STARTER MODULATION FOR PNEUMATICALLY DRIVEN SYSTEMS

Harold L. Ward, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 76,019, Sept. 28, 1970, abandoned. This application Feb. 23, 1973, Ser. No. 335,132

Int. Cl. F15b *13/43*

U.S. Cl. 91—459 **5 Claims**



A compact pneumatic starter modulator including valve assembly means which provides the features and associated functions of actuating, regulating and conditioning pressurized air introduced from an air source to an air driven unit. The actuating feature of the valve assembly employs differentially loaded actuating valve means wherein selectively introducing pressurized air thereto maintains the valve body in the closed position. Trigger means integral with the valve assembly means unbalances the differential loading to open the valve assembly means cooperate therewith to provide for regulating the air pressure delivered to the driven unit via the valve assembly means. Other valve means within the valve assembly means. In addition, third valve means may be included within the combination, which integrally cooperates with the regulating valve means, to introduce selectable quantities of lubricating or conditioning fluid to the air delivered to the driven unit via the valve assembly means.

3,820,445

PRIME MOVER OF THE RADIAL ENGINE TYPE

Walter Klink, Telsiter Str. 12, 7042 Schmiden, Germany

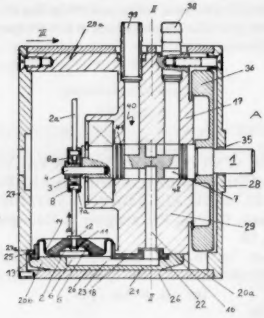
Filed Apr. 14, 1972, Ser. No. 243,957

Claims priority, application Germany, Apr. 17, 1971, 2118641

Int. Cl. F04b *1/00*

U.S. Cl. 91—481 **2 Claims**

The invention relates to a prime mover of the radial type. The mover is driven by rod-like driving elements which are eccentrically linked to the shaft and are essentially radially directed. The other end of each of the driving elements is connected to a diaphragm of the bellows type which encloses a pressure chamber. The pressure chamber alternately is loaded and exhausted with pressure medium depending on the rotating movement of the shaft thus acting on the driving elements whose oscillating movements are directed to the shaft and transformed to a rotary movement.



3,820,446

MEANS AT PRESSURE FLUID CYLINDERS

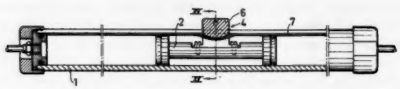
Bo Granbom, Kungsor, and Karl Gunnar Lundqvist, Ektorp, both of Sweden, assignors to Origa Cylindrar AB, Kungsor, Sweden

Filed Dec. 20, 1971, Ser. No. 209,823

Claims priority, application Sweden, Dec. 22, 1970, 17400/70

Int. Cl. F01b *9/00, 29/00*

U.S. Cl. 92—88 **1 Claim**



A pressure fluid cylinder having a slot extending longitudinally along the wall thereof and a piston provided with a projection extending through said slot and slidable with said piston. The slot being sealed by a sealing member along and attracted to the inside of said cylinder to seal the slot beyond the ends of the piston, said piston being interconnected to the sealing member so as to draw the member away from the slot between the ends of the piston as the piston is moved in the cylinder.

3,820,447

METHOD FOR MAKING PERSONALIZED LETTER PACKAGES

Wilfred H. Gendron, and Winslow W. Reed, both of Wilbraham, Mass., assignors to United States Envelope Company, Springfield, Mass.

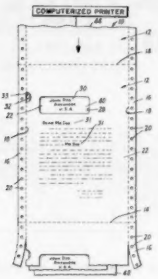
Continuation of Ser. No. 71,673, Sept. 14, 1970, abandoned. This application Feb. 28, 1972, Ser. No. 229,728

Int. Cl. B31b *1/88, 1/90*

U.S. Cl. 93—73 **8 Claims**

A method for making an assembly of series-connected personalized letter packages from a plurality of continuously advancing webs of sheet material. Each package comprises a personalized letter piece having a patch pocket containing a personalized return item and including a window associated with the pocket and through which a portion of the return item is exposed. The address of a recipient, imprinted on the

exposed portion of the return item by a high-speed computer-printer, also serves as the inside address for a letter imprinted



on the letter piece. The computer-printer also imprints the name of the recipient in the salutation and in the body of the letter.

3,820,448

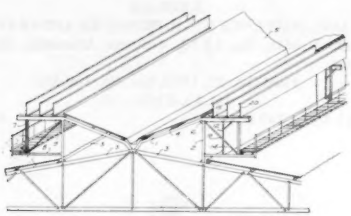
SKYLIGHT TURRET WITH MOVABLE SCREEN FOR INDUSTRIAL HALLS

Petre B. Constantinescu; Stefan Barthon; Constantin Dumitrescu, and Mihail Alexandrescu, all of Bucarest, Romania, assignors to Institute De Proiectari Al Industrei Usoare, Bucharest, Romania

Filed Mar. 9, 1972, Ser. No. 233,162

Int. Cl. F24f *7/02*

U.S. Cl. 98—42 **3 Claims**



A roof vent for an industrial structure or the like which comprises an elongated opening formed in the roof and overlain by a butterfly covering defining a pair of lateral openings. At horizontally spaced locations along each of the openings, there are provided horizontal channels of cantilever mounting in which respective carriages are received, rectangular screen depending from the carriages are movable thereon toward and away from the aforementioned openings. The horizontal supports carrying each screen are surmounted by a plurality of horizontally spaced parallel vertical panels affording protection against rain.

3,820,449

EJECTION MEANS FOR APPARATUS FOR PROCESSING FOOD STUFF

Dawson Eugene Oickle, Block House, Nova Scotia, Canada, assignor to National Sea Products Limited, Halifax, Nova Scotia

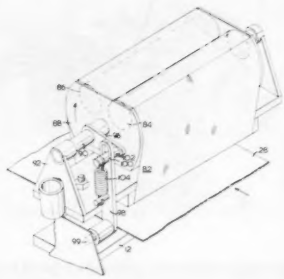
Filed July 25, 1972, Ser. No. 274,966

Claims priority, application Canada, Sept. 14, 1971, 122788

Int. Cl. B30b *15/32*

U.S. Cl. 99—485 **6 Claims**

A shaped food product, particularly fish is made by forming individual portions of the flesh, each being of predetermined size and being in a frozen condition, into a predetermined shape by forcing the flesh portions individually into a forming die cavity adapted to impart the predetermined shape to each



portion. Ejecting means including a web which is drawn across the mouth of the die cavity to positively eject the formed flesh therefrom when the die is retracted are provided.

3,820,450

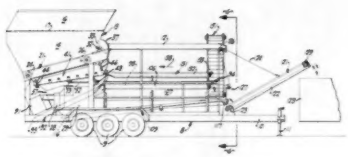
PEPPER STATION

Carl E. Rasmussen, Atwater, and George O. Tiura, Modesto, both of Calif., assignors to Agmac Inc., Ripon, Calif.

Filed Oct. 2, 1972, Ser. No. 294,272

Int. Cl. A23n *15/04*

U.S. Cl. 99—643 **16 Claims**



For treating peppers, such as chili peppers, a stationary or portable machine is provided. An inclined shaking table is mounted on the machine to receive combined pepper portions and stem portions that have been harvested from the growing plant. Upstanding from the table are one or more obstructions in the path of advance of the material adapted to halt such advance momentarily while a knife, in cooperation with the obstruction, severs the stem portion to leave the pepper portion virtually free thereof. The passing materials are subjected to various air blast and gravity drop cleaning operations and are finally presented to a selecting table having a return for materials that need to be reprocessed and discharging selected materials for further handling while conveying reject materials to a suitable point.

3,820,451

AUTOMATIC PACKAGE BINDING MACHINE

Masashi Tanaka, Ogasa-machi, Japan, assignor to Fuji Jidoki Kabushiki Kaisha, Ogasa-Machi, Japan

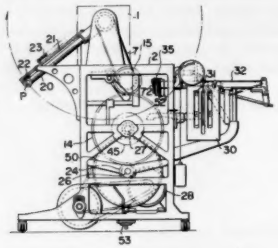
Filed Oct. 10, 1972, Ser. No. 296,051

Int. Cl. B65b *13/22*

U.S. Cl. 100—4 **5 Claims**

A machine for automatically binding or tying a package delivered onto a table wherein the advancing speed as well as

the slackening speed of the string, strap or the like with which to bind or tie the package are suitably controlled. After one



package has been bound, the cut end of the string is grasped by grasping structure so as to ready the string for the next binding operation.

3,820,452

METHOD FOR FORMING AND WASHING A FIBROUS WEB

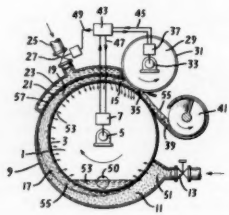
Erik Sture Eriksson, and Gosta Ingemar Ingemarsson, both of Karlstad, Sweden, assignors to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed Dec. 11, 1972, Ser. No. 314,164

Claims priority, application Sweden, Dec. 14, 1971, 16035/71

Int. Cl. B30b 9/20

U.S. Cl. 100—37 **4 Claims**



A layer of fibrous material is formed from a suspension of the fibrous material in a suspension liquid by introducing the suspension into a web-forming space defined between a member impermeable to the suspension liquid and a member that is permeable to the suspension liquid but substantially impermeable to the fibrous material and that is moved along an endless path. The thickness of the web-forming space diminishes from the upstream end to the downstream end thereof, relative to the direction of movement of the permeable member. As the suspension moves through the web-forming space, liquid drains through the liquid permeable member under the influence of pressure developed by the delivery pressure, coupled with the convergence of the space, thereby producing a fibrous layer in the web-forming space. The fibrous layer is washed by supplying liquid under pressure through a permeable element positioned opposite the permeable member downstream from the web-forming space. The volumetric flow rate of liquid is controlled so that the wash liquid displaces the suspension liquid in the web to a depth that is less than the thickness of the layer. The remaining suspension liquid and a small amount of wash liquid are ultimately displaced from the web in a press nip.

3,820,453

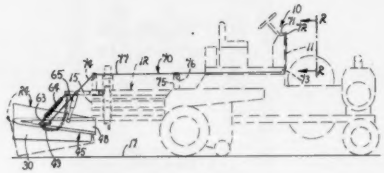
BALE ORIENTING MECHANISM

Lee Tipton, 15092 S. Topeka, Selma, Calif. 93662

Filed Dec. 4, 1972, Ser. No. 311,469

Int. Cl. B30b 15/32

U.S. Cl. 100—188 R **3 Claims**



A bale orienting mechanism for a hay baling machine or the like adapted for earth traversing movement and having a bale compression section, the mechanism having a platform mounted on the machine in bale receiving relation to the section for the support of a portion of each bale during discharge from the section and for gravitational discharge of each of said bales therefrom subsequent to discharge from the section; a chute pivotally mounted on the machine in bale receiving relation to the platform for the receipt of each of said bales in a preselected attitude; and a resiliently tensioned assembly mounting the chute on the machine for pivotal movement under the weight of a bale received therein to position a portion of the bale in contact with the earth during earth traversing movement of the machine so as to draw each of said bales from the chute in the preselected attitude.

3,820,454

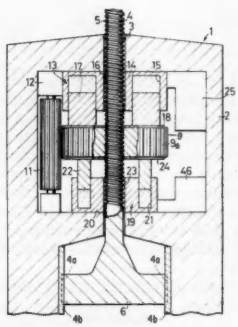
LONG-DISTANCE HIGH-PRESSURE APPARATUS

Masaaki Uchida, No. 13-12, 4-chome, Morishita, Koto-ku,, Japan

Filed Oct. 25, 1972, Ser. No. 300,593

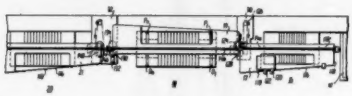
Int. Cl. B30b 1/32

U.S. Cl. 100—269 R **5 Claims**



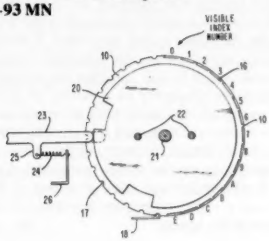
A compressing apparatus is provided which comprises a reciprocating driving shaft which drives a pressure foot at one end thereof toward a mass to be compressed, an engaging plate which engages with the driving shaft, a liquid pressure means having a plunger which pushes forth the engaging plate, and means for returning the engaging plate against the plunger while the liquid pressure in the pressure means is released, thereby to permit repeated movements of the pressure foot against the mass.

3,820,455
EMBOSSING AND ENCODING SYSTEM
Richard L. Hencley, St. Paul; Roger D. McCumber, Hasting, and Donald W. Hewitt, St. Paul, all of Minn., assignors to Data Card Corporation, Minneapolis, Minn.
Filed Nov. 15, 1971, Ser. No. 198,785
Int. Cl. B41j *23/00*
U.S. Cl. 101—93 C **17 Claims**



A machine for embossing numeric and alphabetic data on plastic cards. The embosser is selectively controlled by computer and has a single set of OCR and alphanumeric embossing fonts past which each card is indexed. As the card passes the single alphanumeric font, it is vertically oscillated and may be selectively embossed with several lines of data.

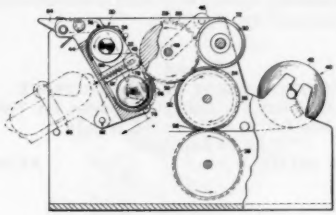
3,820,456
BAR CODE PRINTER
Albert Daniel Wolfheimer, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 2, 1972, Ser. No. 294,058
Int. Cl. B41j *3/50*
U.S. Cl. 101—93 MN **8 Claims**



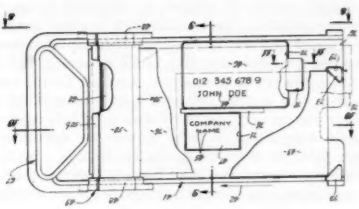
A bar code printer utilizes a plurality of uniform selectively displaceable slugs which are selectively positioned and clamped to form a type font of the bar coded character which is to be printed on a suitable media. The uniform selectively displaceable slugs have a width equal to the smallest bar size which must be printed and the longer bar sizes are printed by selecting multiple adjacent slugs. The slugs are free during selection and clamped prior to and during the printing process to provide a precisely dimensional font of the coded characters to be printed.

3,820,457
PRINTING SYSTEM EMPLOYING AN INK WEB
Edward K. Bullock, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Division of Ser. No. 93,136, Nov. 27, 1970, Pat. No. 3,774,538. This application Nov. 13, 1972, Ser. No. 305,875
Int. Cl. B41j *35/28*; **B41f** *31/00*
U.S. Cl. 101—244 **7 Claims**

A printing system, particularly adapted for clean, economic printing of small quantities with a minimum of makeready, employs a disposable ink web for providing a source of ink preworked to proper printing consistency. The ink web, which is an elongated strip of flexible material carrying preworked printing ink, is supplied in pre-inked form and is adapted to be mounted in the printing press and fed by the press drive in synchronism with the rotary motion of the plate cylinder for application of ink of proper printing consistency from successive portions of the web to the press plate throughout the length of the web. Preferably, the web is supplied in a disposable cassette which is releasably mounted in the press in connection to the drive thereof, and includes at least one opening for exposing portions of the web for inking of the press-plate.

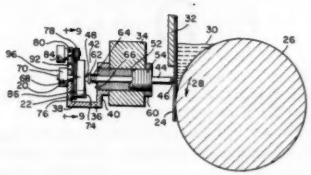


3,820,458
ELIMINATION OF UNCONTROLLED BACKGROUND REPRODUCTION DURING PRINTING
Andrew M. McInnis, Covina, Calif., assignor to Sheldon Industries Inc., Monrovia, Calif.
Filed Sept. 18, 1972, Ser. No. 290,169
Int. Cl. B41f *3/04*
U.S. Cl. 101—269 **13 Claims**



A pressure roller travels relatively over a sheet to urge the sheet either against indicia or against rail means, to prevent uncontrolled smudging and to accept controlled smudging.

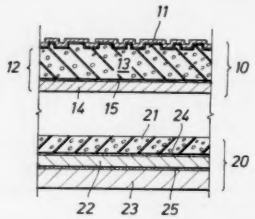
3,820,459
OFFSET PRESS FOUNTAIN KEYS
Franklin O. Paul, 7006 Penarth Ave., Upper Darby, Pa. 19082
Filed June 15, 1972, Ser. No. 263,300
Int. Cl. B41f *31/04*
U.S. Cl. 101—365 **6 Claims**



Fountain keys for adjusting the amount of ink discharged from an offset printing press ink fountain to the fountain roller which includes an elongate rod carrying a hardened steel ball in contact with the fountain blade. The rod serves as a follower in conjunction with a cammed surface to precisely position each steel ball with respect to the fountain blade. The

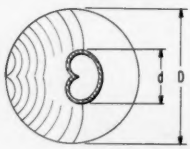
rods are slidable within aligned bushings and are spring biased towards the cammed surface in a manner to completely eliminate the need for threaded components to function the rods relative to the fountain blade. A vernier scale is disposed upon the fountain key operator to facilitate subsequent adjustment of the key positions.

3,820,460
ELECTROTYPE MAGNETIC PRINTING PLATE
Clarence R. McElreath, P.O. Box 13149, Houston, Tex. 77019
Filed Dec. 28, 1970, Ser. No. 101,631
Int. Cl. B41f *27/02*
U.S. Cl. 101—382 MV **4 Claims**



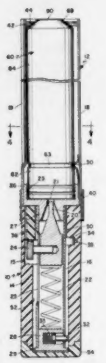
An electrotype printing plate member attachable to a supporting saddle member or cylinder by magnetic forces. The print member includes a thin metallic shell, in which a printing surface is carried, and may be filled by a thermoplastic material, and backed by a ferrous material such as steel; or the shell may be filled directly by a magnetic material. Either one or both members may include a layer of ferrous material such as steel. Either one or both members may include a layer of a permanently magnetized material formed by dispersion of anisotropic particles of ferromagnetic material in a binder. If both members include a layer of ferrous material the magnetized material may lie independently between the members.

3,820,461
INITIATION AIMED EXPLOSIVE DEVICES
Denis A. Silvia, 7 Shalimar Dr., Shalimar, Fla. 32579
Filed Feb. 20, 1970, Ser. No. 13,237
Int. Cl. F42b *3/00*
U.S. Cl. 102—22 **19 Claims**



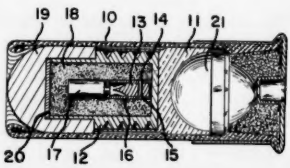
The detonation of charge-around-case explosive devices is accomplished by combinations of initiation logic, detonation wave interactions, controlled case forming implosion and analog-to-digital methods of path control to enhance the directionality, projection of kill mechanism and environmental coupling of the charge in a variety of warhead/target intercept conditions. Numerous variants are developed to give a wide choice of geometries and complexity.

3,820,462
AERIAL SIGNAL UNIT
Charles H. Jackson, Jr., 137 Walnut Hill Dr., San Marcos, Calif. 92069
Filed Jan. 29, 1973, Ser. No. 327,567
Int. Cl. C06d *1/04*; **F42b** *13/38*
U.S. Cl. 102—35.6 **18 Claims**



An aerial signal unit having a rocket propelled signal carried in a disposable launcher in compact, self-contained form. The launcher has a barrel in which the signal is stored and fired, a handle on the launcher being extended telescopically and locked open to expose a thumb actuated firing pin. Safety means is incorporated in the launcher to prevent accidental firing. The signal is adaptable to a variety of payloads and is designed to penetrate obstacles such as overhead foliage and similar minor barriers. The barrel is internally ribbed to guide the signal with minimum friction, while allowing space for escape of exhaust gases, the signal being scaled and securely held in the barrel until fired. At the instant of firing the exhaust gases are trapped to ensure breaking of the seal and proper release of the signal.

3,820,463
SHOTGUN GRENADE
Guy W. Leonard, China Lake, and Hubert M. Ross, Jr., Bethel Island, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 30, 1972, Ser. No. 303,154
Int. Cl. F42b *5/02*, *9/02*
U.S. Cl. 102—38 **4 Claims**

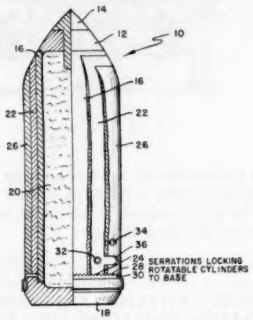


A grenade comprising a nose, a fuze, a fragmentation cylinder, a tail section and an explosive charge loaded into a standard shotgun shell. The grenade is designed to fly in a stable state and to explode to produce fragments.

3,820,464
VARIABLE SIZED FRAGMENT EXPLOSIVE PROJECTILE

Lewis C. Dixon, Mount Airy, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 9, 1973, Ser. No. 342,023
Int. Cl. F42b *13/48*
U.S. Cl. 102—67 5 Claims

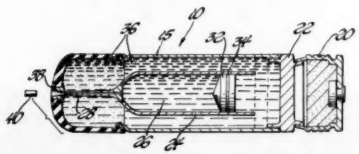


A fragmentation projectile having a plurality of telescoping hollow concentric cylinders, each having a scored, failure, grid pattern, forming the shell of the projectile filled with an explosive. The outer cylinders may be manually rotated in the field prior to firing so as to align or misalign the failure grids of one cylinder to another to produce various fragment size and patterns. Mating serrations on the shell base and the cylinders lock the cylinders in the selected position.

3,820,465
SEDATIVE BULLET

John B. Delphia, 5 Broadwater, Coventry, England

Filed Feb. 9, 1973, Ser. No. 330,911
Int. Cl. F45b *5/12*
U.S. Cl. 102—92 14 Claims



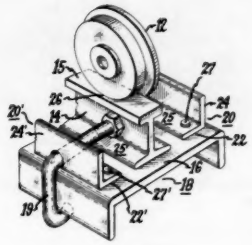
A sedative delivering bullet assembly comprising: an outer casing member, at least a portion of which is collapsible; a fluid carrying vessel supported within the casing member, the vessel including fluid injection means; fluid means disposed within the casing member for movement in response to the collapse of the collapsible portion; and discharge means for coacting with the moving fluid means for discharging the vessel.

3,820,466
MAGNETIZED CRANE RAIL TROUGH-ANTI-CONTAMINANT TROUGH

Maurice R. Allen, Ghent, N.Y., assignor to General Electric Company

Filed July 23, 1973, Ser. No. 381,703
Int. Cl. B61b *29/02*
U.S. Cl. 104—1 R 5 Claims

A trough capable of collecting both magnetic and non-magnetic particles and subsequently confining, at the very least, magnetic particles that fall onto said trough from a track rail and wheel assembly or other particle source. The trough is

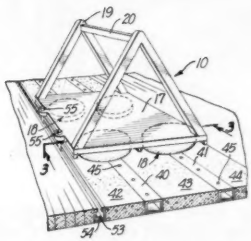


linear in shape, has a magnetized side and is placed parallel, adjacent and partially beneath the rolling surface of the rail.

3,820,467
CONVEYOR SYSTEM WITH AIR IN FLOOR

Robert E. Burdick, Santa Barbara, Calif., assignor to Rolair Systems, Inc., Santa Barbara, Calif.

Filed Oct. 18, 1972, Ser. No. 298,465
Int. Cl. B61b *13/00*
U.S. Cl. 104—23 FS 9 Claims



An air cushion conveyor system for an assembly line or the like. A track for a plurality of transporters, each supported on air bearings, with air supply ducts for the bearings in the track. Track manufactured in sections for assembly on the site, and incorporating air ducts and transporter drive units.

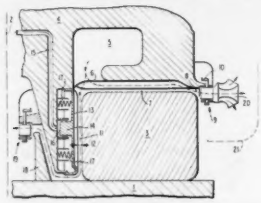
3,820,468
AIR CUSHION VEHICLE, ESPECIALLY RAIL-BOUND AIR CUSHION VEHICLE

Michael Simon, Munich-Obermenzing, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Germany

Filed July 17, 1972, Ser. No. 272,697
Claims priority, application Germany, July 17, 1971, 2135902
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 FS 37 Claims

An air cushion vehicle, especially a rail-bound air cushion vehicle in which air is used both for the support of the vehicle

above the roadway and for the propulsion of the vehicle whereby the air escaping out of the air cushion is deflected by



way of guide devices into a horizontal direction parallel to the driving direction.

3,820,469

DEVICE FOR TRANSPORTATION OF LOADS BETWEEN OPERATIONS

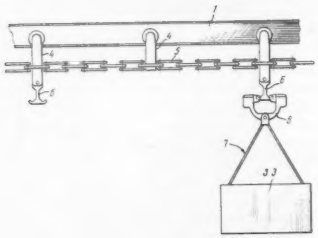
Mikhail Abramovich Rikman, ulitsa Molodogvardeiskaya, 24, korpus I, kv. 51, and Felix Semenovich Ioffe, ulitsa Izumrudnaya, 6, kv. 72, both of Moscow, U.S.S.R.

Continuation of Ser. No. 163,712, June 19, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 313,750

Claims priority, application U.S.S.R., Nov. 4, 1970, 1483014

Int. Cl. B61b *3/00, 7/08*

U.S. Cl. 104—96 **1 Claim**



The device of the present invention comprises overhead guide tracks along each of which carriages travel carrying a traction member and hooks for attaching a hanger with a load. Between these tracks there is arranged an overhead transfer conveyor, each trolley of which has a fork engaging with a carriage when the load is being transferred, and a lever for gripping the hanger. The lever is supported on master guides for lifting or lowering it when the hanger is being removed from or attached to a hook. These guides have a shaped groove fixing the trolley in the engagement zone. The front tooth of the fork is designed longer to be than the rear one, which makes it possible to select a length of the shaped groove that will ensure a reduction of the dynamic loads when a trolley with its load stops.

3,820,470

GUIDANCE MEANS FOR MAGNETICALLY SUSPENDED RAILWAY VEHICLES

Ludwig Karch, and Siegfried Nowack, both of Munich, Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Ottobrunn near Munich, Germany

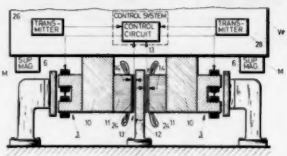
Filed Dec. 8, 1971, Ser. No. 206,091

Claims priority, application Germany, Dec. 11, 1970, 2060970

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 MS **19 Claims**

In the disclosed magnetic suspension railway system, a vehicle's adjustably excitable guide magnets define air gaps with parts of a track arrangement. The air gaps are associated in pairs along the length of the vehicle. The excitation of the guide magnets is adjusted in dependence upon variation of the ratio of the arithmetic mean of the gap widths in each pair of



air gaps to the effective value of said gap widths. In one embodiment the vehicle is driven by a linear motor. The excitation of the guide magnets is adjustable in dependence upon variations of the motor air gaps.

3,820,471

MAGNETIC LEVITATING AND PROPELLING DEVICE INCLUDING SPLIT STABILIZING COIL FOR HIGH SPEED TRAIN

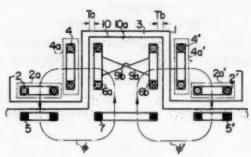
Naoki Maki, Ibaraki-ken, and Hironori Okuda, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 6, 1973, Ser. No. 367,367

Claims priority, application Japan, June 15, 1972, 47-59690

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 SS **4 Claims**



A device for magnetically levitating and propelling a car at a high speed utilizing magnetic repulsion in which a stabilizing coil disposed on the ground opposite to a pair of superconducting coils is split into a pair of stabilizing coil sections which are supported in close proximity to the respective superconducting coils so as to reduce the electromagnetic force acting between the superconducting coils and to reduce the magnetomotive force required for these superconducting coils.

3,820,472

TWO-SIDED LINEAR INDUCTION MOTOR ESPECIALLY FOR SUSPENDED VEHICLES

Peter Schwarzler, Furstenfeldbruck, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Jan. 16, 1973, Ser. No. 324,150

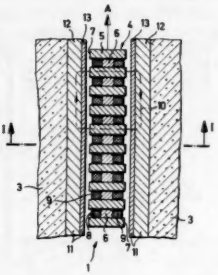
Claims priority, application Germany, Jan. 17, 1972, 2202052

Int. Cl. H02k *41/02*

U.S. Cl. 104—148 LM **9 Claims**

A magnetically suspended vehicle is provided with a two-sided linear induction motor having a central winding struc-

ture or assembly flanked by a pair of rails magnetically cooperating with the winding structure for propelling the vehicle. The rails of ferromagnetic material are coated with a layer of high electrical conductivity along their faces turned toward the winding structure.

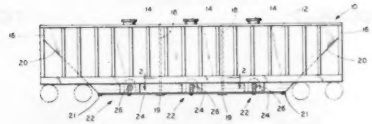


3,820,473

RAILWAY HOPPER CAR CLOSURE ACTUATING MECHANISM

George S. McNally, South Holland, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 18, 1972, Ser. No. 298,697
Int. Cl. B61d *7/02, 7/20, 7/26*
U.S. Cl. 105—250 **10 Claims**



A hopper car having a continuous discharge opening and including a transversely sliding hopper discharge gate suspended on a hanger having rollers moving on support beams in transverse tubular type hoods to provide for smooth movement of the gate. An operating screw, the hanger member, and the support beams are positioned under cross ridge hoods which connect longitudinally extending side slope sheets to thereby provide a concealed operating mechanism and eliminate the need for intermediate transversely extending slope sheets.

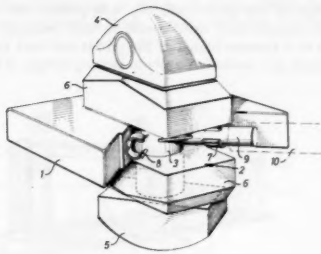
3,820,474

MANUAL CONLOCK

Hans Ulrich Backteman, Bromma, and Richard John Taylor, Johanneshov, both of Sweden, assignors to AB Backtemans Patenter, Bromma, Sweden

Filed Feb. 1, 1972, Ser. No. 222,572
Claims priority, application Sweden, Feb. 12, 1971, 1850/71
Int. Cl. B65j *1/22;* **B61d** *45/00*
U.S. Cl. 105—366 B **8 Claims**

A manually vertical coupling device for disengageably securing a freight container to another container or to a loading platform. The coupling device is a separate unit having turnable twist-locks extending in opposite directions, which twist-locks in an initial position are insertable in elongate apertures in the corner castings of a container. The body of the coupling device is a solid mass having a through shaft turnably journalled therein. The shaft is integral with the twist-locks and is manually actuatable between a non-clamping position and a clamping position for securing the containers.

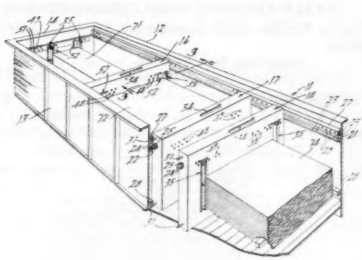


3,820,475

SIDE SWAY BRACE FOR GONDOLA BULKHEAD

Harry E. Beeson, Livonia, Mich., assignor to Evans Products Company, Plymouth, Mich.

Filed Apr. 2, 1973, Ser. No. 346,754
Int. Cl. B61d *45/00*
U.S. Cl. 105—376 **20 Claims**



A bracing arrangement particularly useful for adapting a gondola type railroad car for the shipment of sheet steel or the like. The car is equipped with gondola bulkheads. Each bulkhead is provided with attachment means that permit the detachable connection of side sway braces to the bulkhead faces for holding the transported material against transverse movement. In addition, the attachment means of the bulkhead afford a detachable connection for face spacers that space the face of the load a distance from the bulkhead sufficient to permit the insertion of a sling for loading and unloading. In an embodiment of the invention, the face spacers incorporate relatively movable parts with a wedging arrangement so as to permit easy withdrawal for unloading.

3,820,476

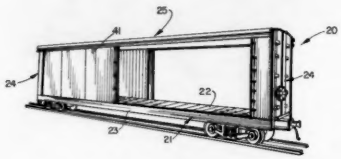
ROOF CONSTRUCTION FOR FREIGHT CARRYING LAND VEHICLES

Lynn J. Harter, Buford, and Morris Warshal, Chamblee, both of Ga., assignors to Southern Iron & Equipment Company, Chamblee, Ga.

Filed Aug. 23, 1973, Ser. No. 391,031
Int. Cl. B61d *17/12*
U.S. Cl. 105—404 **8 Claims**

A roof construction primarily intended for boxcars of the all door type wherein the roof is secured to and supported solely by the bulkheads at the ends of the car and must in turn provide lateral support for the doors which constitute the sides of the car. The roof construction utilizes a single girder extend-

ing between the bulkheads and anchored thereto and which is connected to side plates, by which the doors are laterally supported and guided, by roof rafters which extend between the top flange of the girder and the side plates, and angularly disposed lateral roof ties, which extend between and are secured to a bottom flange of the girder and said side plates. Roof sheets are welded directly to the top flange of the girder



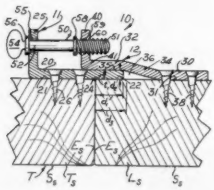
and to the side plates and thus become a part of the top flange of the girder. By this construction, the weight of the roof may be held to a minimum without sacrificing strength necessary to control deflection, so that the side doors and movable bulkheads, if utilized, will operate properly with suitable vertical operating clearance, without subtracting from the amount of lading which may be placed in the car, and so as to provide the lowest possible center of gravity of the car from the rails.

3,820,477

TABLE ALIGNING AND LOCKING DEVICE

Groves L. Griffin, 3248 Donnebrook Ln. S.E., Atlanta, Ga. 30354

Filed May 30, 1973, Ser. No. 365,254
Int. Cl. A47b
U.S. Cl. 108—89 **6 Claims**



An alignment and locking device for a table having separable sections including a male member attached to one of the opposed sections adjacent its abutting edge and a female member attached to the other of the opposed sections adjacent its abutting edge in alignment with the male member so that as the sections are moved toward each other the male and female members interact to align the table sections. A locking member interconnects the male and female members to force them together and force the edges into abutting engagement.

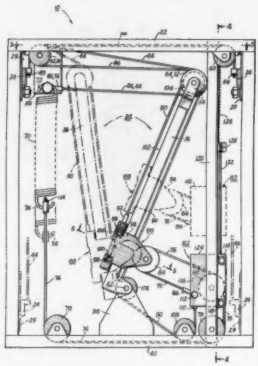
3,820,478

ARTICLE SUPPORT STAND

Eckhard J. Bergenthal, Glassboro, N.J., assignor to Caddy Corporation of America, Pitman, N.J.

Filed July 11, 1972, Ser. No. 270,819
Int. Cl. A47b *9/02*
U.S. Cl. 108—136 **15 Claims**

An article support platform is resiliently mounted in the frame of an article support stand for reciprocal vertical movement in the stand in order to support a stack of articles, such as trays, dishes and the like, with the uppermost article in the stack located at a predetermined level at all times. The resilient support mechanism for the platform includes a lever which is pivotally mounted in the frame at a fixed pivot point and operatively connected to the platform by at least one flexible cable so that the lever is caused to pivot about its fixed pivot point during vertical movement of the platform. A



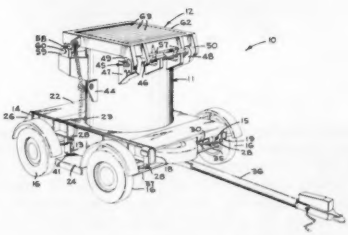
resilient spring or the like is operatively connected between the lever and the frame to resist downward vertical movement of the platform while biasing the lever in a predetermined direction to urge the platform towards its uppermost position.

3,820,479

MOBILE CONTAINER FOR SAFELY HANDLING EXPLOSIVES

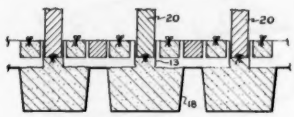
Donald R. Fylling, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 23, 1973, Ser. No. 335,404
Int. Cl. E06b *9/00*
U.S. Cl. 109—1 **7 Claims**



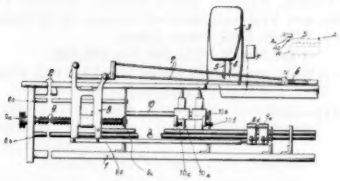
A mobile container in which an explosive, such as an infernal machine or a time bomb, can be placed after discovery for transport to a suitable location for disarming and whereby, in the event of an accidental explosion within the container, there will be no resultant injury to persons or damage to property adjacent thereto. The container has an upright cylindrical shape with the shell and base thereof being made of aluminum armor plate. A cover, pivotally connected to the top of the container, is made in the form of a ballistic grille to vent explosion gases in an upwardly direction, and a wheel suspension system is provided allowing the container to resiliently deflect downward in response to a detonation within the container so as to seat the container upon the wheel support surface and thereby prevent damage to the wheel suspension system.

3,820,480
APPARATUS FOR TRANSPLANTING PLANTS
Fred N. Blackmore; Fred N. Blackmore, Jr., and John R. Trachet, all of 2412 Yost Ave., Ann Arbor, Mich. 48104
Division of Ser. No. 245,376, April 19, 1972. This application Sept. 17, 1973, Ser. No. 397,788
Int. Cl. A01c 11/02
U.S. Cl. 111—2 4 Claims



Apparatus for transplanting plants from a compartmented germinating tray to a soil bed within which the plants can grow. The apparatus provides for positioning a substantial number of the compartments in the germinating tray above and in a closely spaced relation with the soil bed in which the plants are to grow, concurrently pushing the plants and the soil in the large number of compartments of the tray out the bottom of the tray and into the soil bed, and then indexing the tray so that other large number of the plants therein can be pushed downwardly into the soil bed.

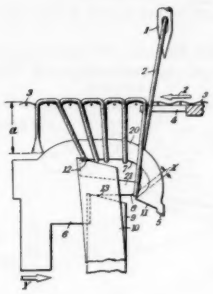
3,820,481
DEVICE FOR USE IN SEWING APPARATUS
Karl Nicolay, Bielefeld, Germany, assignor to Durkoppwerke GmbH, Bielefeld, Germany
Filed Aug. 8, 1973, Ser. No. 386,495
Claims priority, application Germany, Aug. 21, 1972, 2241044
Int. Cl. D05b 3/06
U.S. Cl. 112—68 10 Claims



A cutter device for use in a sewing apparatus, especially for the formation of angle incisions at the ends of a pocket slit flanked by a pair of parallel stitch seams comprises a pair of blades forming the angle between them and means for adjusting both the angle and the depth of penetration of the blades into the workpiece and reinforcing strip to control the lengths of the legs of the angle incision and their orientations with respect to the pocket incision.

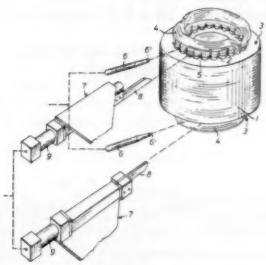
3,820,482
TUFTING MACHINES
Douglas George Woodcock, Burnley, England, assignor to Edgar Pickering (Blackburn) Limited, Blackburn, Lancashire, England
Filed Apr. 13, 1973, Ser. No. 351,001
Int. Cl. D05c 15/32, 15/22
U.S. Cl. 112—79 A 2 Claims

A cut pile tufting machine which includes mechanism for feeding yarns at a higher or at a lower speed to selected needles under pattern control, oscillating tufting hooks each of which has spaced upper and lower bills which face in the direction opposite to the direction of travel of backing cloth through the machine, the upper bill only entering the loop just formed by a needle upon oscillation of the hook towards the needle, the upper bill being hook shaped and having a lower surface adjacent the tip of the hook along which the loops travel as the backing cloth travels through the machine



towards a slot between the two bills, the loops being pulled through the slot, when under tension, to be caught in the bight of the hook to produce low pile and the loops, when not under tension, moving past the slot on to the lower bill to produce high pile, and knives which coact with the hooks to sever loops on both bills of the hooks.

3,820,483
APPARATUS FOR BINDING A WINDING HEAD
Hans Herl, Kongen; Klaus Hurlebaus, Plochingen, and Fritz Sauer, Esslingen-Sulzgries, all of Germany, assignors to Licentia-Patent-Verwaltungs GmbH, Frankfurt, Germany
Filed Apr. 21, 1972, Ser. No. 246,247
Claims priority, application Germany, Apr. 24, 1971, 2120185
Int. Cl. D05b 3/00
U.S. Cl. 112—121.2 4 Claims



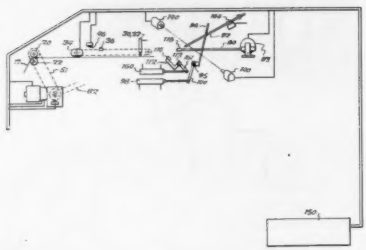
An apparatus has a binding needle for binding a winding head having coils which extend beyond the frontal face of a magnetic core holding the winding sides of the coils. A pre-punch needle is provided. The pre-punch needle is radially movable with respect to the axis of the magnetic core. A motion producing member is operatively arranged to move the pre-punch needle into and out from interstices enclosed by the winding sides extending beyond the frontal face of the magnetic core, the winding head and the magnetic core. In operation the pre-punch needle widens the interstices before the binding needle is inserted into the interstices.

3,820,484

CAP MAKING APPARATUS AND METHOD

William M. Neill, and George A. Burt, Jr., both of San Jose, Calif., assignors to International Paper Company, New York, N.Y.

Filed July 26, 1972, Ser. No. 275,353
Int. Cl. D05b *21/00*
U.S. Cl. 112—121.26 6 Claims



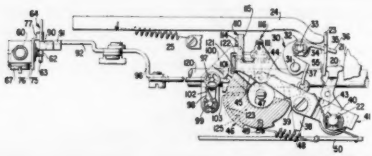
A cap making apparatus and method where a body of a fabric piece is rotated along an axis through its central portion and in timed relation to the movement of an edge of the fabric through a sewing machine. A stretched elastic material is attached by the sewing machine to the fabric piece along a closed curve. In one embodiment, excess fabric is trimmed during rotation of the piece, and the axis is fixed, the curve thereby becoming a closed circle. Rotational movement may be transmitted to the central portion by gripping and rotating that portion.

3,820,485

PATTERN CAM FOLLOWER THROW-OUT MECHANISM FOR SEWING MACHINES

Robert Bradus, Linden; Edward A. Bruder, Roselle, and Frederick Rogers, Union, all of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 11, 1973, Ser. No. 359,281
Int. Cl. D05b *3/02*
U.S. Cl. 112—158 A 6 Claims



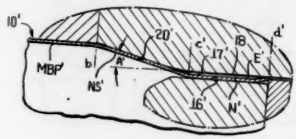
A single operator influenced control member is disclosed in a sewing machine together with mechanisms associated therewith for effecting in seriatim an uncoupling of the needle reciprocating drive and elevation of the needle bar, a withdrawal of the pattern cam followers out of tracking relation with the pattern cams, and the setting of a latch device for preventing return of the operator influenced member. The retrograde preventing latch device is released by the ensuing operation of the sewing machine actuating mechanism.

3,820,486

RENECKING METHOD

John T. Hilgenbrink, Oak Lawn, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 7, 1972, Ser. No. 242,107
Int. Cl. B21d *51/26*
U.S. Cl. 113—120 M 13 Claims



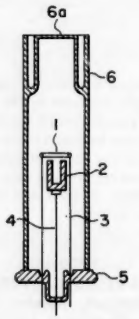
This disclosure relates to a method of improving axial static load resistance of tubular metallic bodies, specifically can bodies, by first necking-in a normally cylindrical open end (or ends) of the metallic body to form a neck shoulder forming the transition area between the body proper and its neck, and thereafter renecking the body open end to reduce the angle of the neck shoulder to between 13°–18°. Pursuant to this method different degrees of axial load resistance improvement were obtained ranging from 25 percent to 53 percent. Preferably renecking penetration is 0.020 inch axially greater than the initial necking penetration thus achieving the advantage of increased body height after renecking approximately 0.010 inch.

3,820,487

LIGHT SOURCE LAMP CATHODE FOR ATOMIC LIGHT ABSORPTION ANALYSIS FORMED BY COMPRESSING POWDER OF CD CU WITH ONE OF THE POWDERS OF PB BA, PB CA OR PB SR

Sadami Tomita, Katsuta; Akira Hosoya, Hitachi; Hiroshi Okagaki, and Yoji Arai, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 9, 1973, Ser. No. 358,546
Claims priority, application Japan, May 12, 1972, 47-46315
Int. Cl. H01j *61/08*
U.S. Cl. 313—209 3 Claims



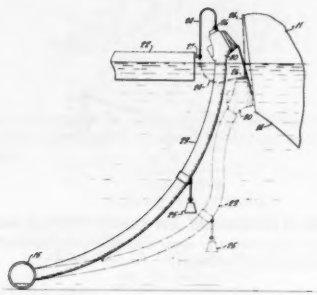
A hollow cathode lamp for atomic light absorption analysis which includes a hollow cathode fabricated by mixing and compressing the powder of Cd_3Cu with at least one of the powders of Pb_3Ba, Pb_3Ca and Pb_3Sr in a predetermined volume ratio into a hollow cathode shape.

3,820,488

UNDERWATER SEWAGE COLLECTION SYSTEM FOR DOCKED BOATS

Harold E. Johnson, 5211 E. Ocean Blvd., Long Beach, Calif. 90803

Filed Feb. 23, 1973, Ser. No. 335,434
Int. Cl. B63b *35/32*
U.S. Cl. 114—.5 R 10 Claims



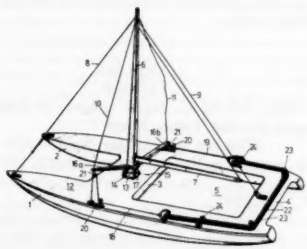
In an underwater sewage collection system for docked or moored boats or ships of the type including underwater collection means for receiving sewage and conduit means for conducting the sewage from the boat or ship to the sewage receiving means, there is disclosed an improvement comprising connector means for releasably connecting the conduit means to an underwater sewage outlet port of the boat or ship, such connector means being handled entirely from the inside of the boat or ship and the dock or other floating mooring alongside the boat.

3,820,489

SAFETY RIG FOR MULTI-HULL BOATS

Franz Xaver Wortmann, Boblingen, Germany, assignor to Kortenbach & Rauch Kommanditgesellschaft, Soligen-Weyer, Germany

Filed Dec. 14, 1972, Ser. No. 315,084
Claims priority, application Germany, Dec. 21, 1971, 2163329
Int. Cl. B63h *9/00*
U.S. Cl. 114—39 6 Claims



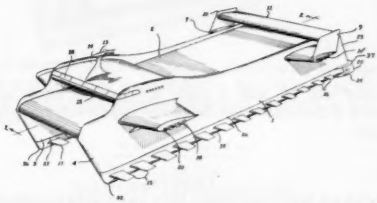
A multi-hull boat having its floating bodies interconnected by traverses and being equipped with a mast mounted on the deck by means of shrouds and braces, said mast being tiltable toward the port side and the starboard side while spring means are provided between the anchoring means for the shrouds.

3,820,490

WATERCRAFT

Richard R. Greer, 6125 E. Indian School Rd., Scottsdale, Ariz. 85251

Continuation-in-part of Ser. No. 231,194, March 2, 1972, Pat. No. 3,768,429. This application Apr. 24, 1972, Ser. No. 246,776
Int. Cl. B63b *35/44*
U.S. Cl. 114—66.5 H 3 Claims



A watercraft for transporting cargo is disclosed. The watercraft is supported by lift generated by: a planar surface set at a given angle of attack with respect to the air stream, air foil surfaces, hydrofoils and to some extent by the displacement of water. A control system for maneuvering the watercraft controls the angular orientation of the hydrofoils with respect to horizontal. The hydrofoils, in combination with the forward motion of the watercraft, orient the watercraft with respect to its displacement within the water and the angular relationship of the watercraft with respect to the surface of the water. The angular orientation has the effect of altering the angle of attack of the planar surface and the air foils and thereby modifies their effectiveness as lift generating members. The watercraft employs a docking system extending from the sides thereof, which docking system cooperates with a pair of land based guide rails. On docking, the watercraft is "flown" onto these guide rails and then slowed down. As the watercraft slows down, the guide rails begin to support its weight. Similarly, when the watercraft departs from the dock and begins to accelerate, the hydrofoils and lift generating members begin to support the watercraft with less and less dependence on the guide rails for support.

3,820,491

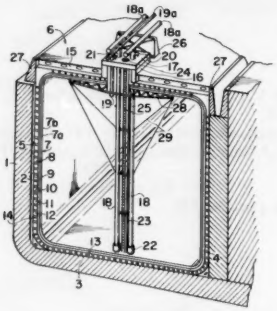
LOW TEMPERATURE LIQUEFIED GAS TANKER SHIP EQUIPPED WITH MEMBRANOUS VESSELS

Katsuro Yamamoto, Tokyo, Japan, assignor to Bridgestone Liquefied Gas Company, Ltd., Tokyo, Japan

Filed Mar. 27, 1972, Ser. No. 238,347
Claims priority, application Japan, Apr. 27, 1971, 46-27195
Int. Cl. B63b *25/08*
U.S. Cl. 114—74 A 1 Claim

A tanker ship construction equipped with low temperature liquefied gas tanks having membranous vessels for containing low temperature liquefied gases. The tank is mounted within a hold space prepared in the ship hull. The tank includes an outer box of a steel structure and a heat insulating layer. The outer box has side walls and a bottom adapted to be just strong enough to hold the whole shape thereof for the convenience of the construction and assembly, but not strong enough to support the inner pressure applied by the low temperature liquefied gases loaded in the membranous vessel. The box also

has a roof adapted to form by itself a roof portion of the hull, whereby the construction of the tank as well as the assembling

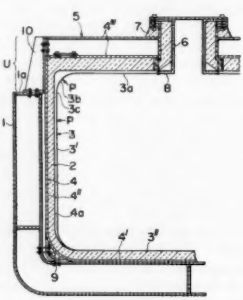


thereof into the hull is made substantially easier and the period of construction of the tanker ships is substantially shortened.

3,820,492
TANKER WITH MEMBRANE TANKS FOR CARRYING LOW-TEMPERATURE LIQUIFIED GAS

Katsuro Yamamoto, Tokyo, Japan, assignor to Bridgestone Liquefied Gas Company Limited, Tokyo, Japan

Filed Dec. 29, 1972, Ser. No. 319,153
Claims priority, application Japan, Dec. 28, 1971, 46-868
Int. Cl. B63b *25/08*; **B65d** *25/18*
U.S. Cl. 114—74 A **6 Claims**



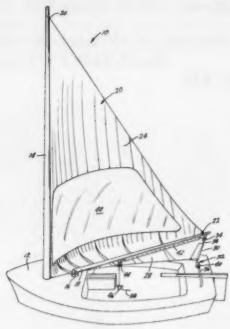
A tanker for transporting low-temperature liquified gases having a tank structure therein constructed separately therefrom. The tank structure is disposed within the hold space and is constructed with a rigid exterior outer vessel having an inner membrane tank for storing low-temperature liquified gases. The inner tank is constructed as a flexible inner fluid-container vessel made of a thin metallic membrane. The tank structure is constructed independently of the ship itself and then is inserted into the ship structure or hold thereof.

3,820,493
SAILBOAT IMPROVEMENTS

James L. Amick, 1464 Cedar Bend Dr., Ann Arbor, Mich. 48105

Filed Oct. 26, 1972, Ser. No. 301,231
Int. Cl. B63h *9/04*
U.S. Cl. 114—102 **12 Claims**

A fore-and-aft rigged sailboat that has a sail made of flexible material, and includes a flap portion that is adapted to lie on the deck when the sail is in the close-hauled position so as to prevent any substantial flow of air laterally under the sail from

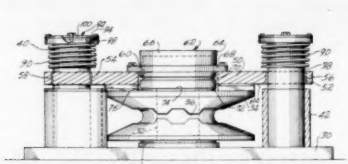


the windward to the leeward side thereof. The sail may be either a jib or a mainsail and some embodiments have a transparent panel to provide visibility.

3,820,494
CHAIN STOPPER

George B. Hall, Jr., Torrance, and Joseph E. Stevens, Arcadia, both of Calif., assignors to Global Marine Inc., Los Angeles, Calif.

Filed Apr. 18, 1973, Ser. No. 352,276
Int. Cl. B63b *21/18*
U.S. Cl. 114—200 **2 Claims**



There is described a chain stopper for the anchor chain of a ship in which the chain passes around the pulley of a fairlead. One surface of the pulley extending perpendicular to the axis of rotation is provided with a plurality of lugs which may be engaged or disengaged by a plurality of dogs which are integral with a plate movable along the axis of rotation of the fairlead pulley by a pneumatic piston. The plate is movably supported on a pair of guides which are located on either side of the fairlead. Springs normally urge the plate into position in which the lugs and dogs are engaged to prevent rotation of the fairlead pulley.

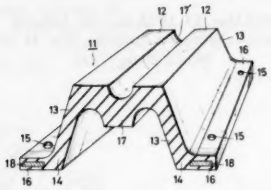
3,820,495
FENDER

Shigeo Ueda, Yokohama, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Feb. 7, 1973, Ser. No. 330,451
Claims priority, application Japan, Feb. 10, 1972, 47-16273
Int. Cl. B63b *59/02*
U.S. Cl. 114—219 **4 Claims**

A fender adapted to be fixedly mounted on the surface of the quay or the like for elastically engaging with the broadside of a vessel which fender comprises a body made of elastic material such as natural or synthetic rubber substantially having a bottom wall to be contacted with the broadside and opposite side walls for forming a hollow space defined thereby with the quay surface, the inner surface of said top wall having

an inwardly projected rib so that when the body is extensively collapsed said rib may abut on the quay surface to support the top wall together with said opposite walls for absorbing further



shock energy. Due to such construction of the fender, a considerably wide range of the shock energy can be effectively absorbed.

3,820,496

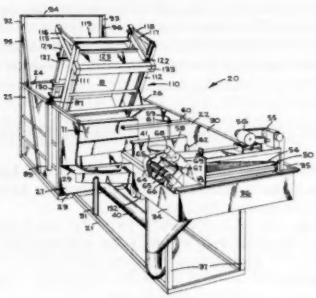
CONVEYER FEEDER

Charles E. Sheetz, Woodstock, Va., assignor to FMC Corporation, San Jose, Calif.

Filed May 12, 1972, Ser. No. 252,647

Int. Cl. B65g *65/04*

U.S. Cl. 214—313 **7 Claims**



An elevator receives a bin with articles of produce therein at a location above a tank of water and is operated to immerse the bin within the tank to discharge the articles. A dump mechanism on the elevator pivots the immersed bin about an upper side edge thereof to dump the articles from the bin over a partition separating a portion of the tank under the bin from a portion of the tank over an inclined conveyer that transports the articles upwardly out of the tank. Bins of a variety of sizes can be clamped upon the elevator with one side edge thereof at a uniform location relative to the pivotal axis of the dump mechanism, and the partition is collapsible to minimize the drop from any size bin to the lowermost end of the conveyer. Water circulates to provide a current within the tank that conveys floating articles towards the upper end of the conveyer for removal from the tank. A gate, adjustably positioned over the conveyer, limits the loading depth of articles thereon.

3,820,497

TRANSPORT VEHICLE

Nicolaas Gerardus Konijn, Berkhout, Netherlands, assignor to Konijn Machineblouw N.V., Hoorn, Netherlands

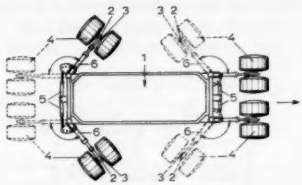
Filed Nov. 15, 1972, Ser. No. 306,589

Claims priority, application Netherlands, May 31, 1972, 7207331

Int. Cl. B60f *3/00*

U.S. Cl. 115—1 R **5 Claims**

A transport vehicle having a main body and adapted to displace itself overland and/or through water. A plurality of legs are each pivotally connected with the main body and each carries a reaction body at its free end which may be swung by means of a power mechanism, with respect to the main body



in such manner that the vehicle is displaced by the reaction forces exerted on the reaction bodies. Each leg may be pivotable with respect to the main body about a vertical axis and/or a horizontal axis.

3,820,498

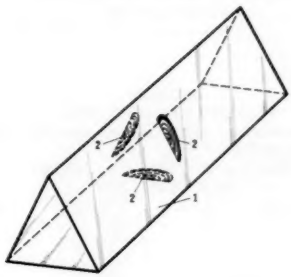
IDENTIFICATION MEMBER

Otto Bosshard, Gruet, Wetzikon, Switzerland, assignor to Zellweger Ltd., Uster, Switzerland

Filed July 1, 1971, Ser. No. 158,707

Int. Cl. G01d *21/00*

U.S. Cl. 116—114 R **1 Claim**



The identification member is an elongated member of triangular cross section incorporating a code sign for detection by automatic article-detecting equipment. The identification member is placed between groups of articles so as to order the detecting equipment to begin itemising or to stop itemising. The identification members serve to mark the beginning and end of a given group of articles.

3,820,499

THERMALLY RESPONSIVE COOKING INDICATOR

George G. Kliewer; John H. Roberts, and Glen R. Gee, all of Fresno, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

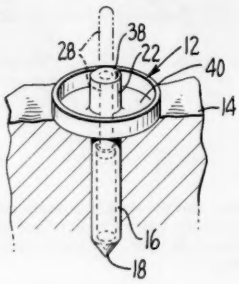
Continuation-in-part of Ser. No. 118,910, Feb. 25, 1971, Pat. No. 3,724,360. This application Mar. 14, 1973, Ser. No. 341,024

Int. Cl. G01k *1/02*

U.S. Cl. 116—114.5 **13 Claims**

A body having a central bore, a plunger in the bore which plunger has a piston-like sealing member that defines a volume within the bore. A heat responsive material within such volume which expands at a predetermined temperature

to move the plunger to an extended position and to afford a visual indication that the predetermined temperature has been attained. The wall of the volume defines a concavity that entraps an air bubble which avoids sudden or explosive change of state in the heat responsive material and promotes gradual movement of the plunger. The heat sensitive material can be a liquid mixture of ingredients chosen to boil at the desired temperature or can be two reactants (e.g., an acid and a base) which, at temperatures below the predetermined temperature are maintained separate from one another by a membrane that melts at the predetermined temperature. An annular cap surrounding the body for positioning the body and the heat responsive material with respect to the surface of an article of food in which the body is inserted.



3,820,500

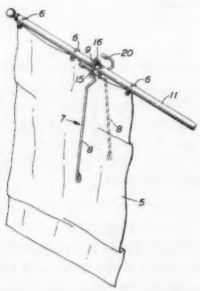
FLAG POLE COMBINATION

Gerald Merryweather, 3120 Crescent Rim Dr., Apt. 307, Boise, Idaho 83704

Filed May 14, 1973, Ser. No. 360,267

Int. Cl. G09f *17/00*

U.S. Cl. 116—174 **6 Claims**



The invention relates to a flag pole with means for supporting a flag thereon and control means swivelly attached to the flag pole which allows the flag to be blown from side to side by the wind but prevents it from wrapping around the flag pole. The pole is preferably provided with stop means which limits the extent to which the control means can be swivelled from side to side.

3,820,501

DEVICE FOR CONVERTING MEASUREMENT FOR METRIC TO IMPERIAL SYSTEM AND VICE VERSA

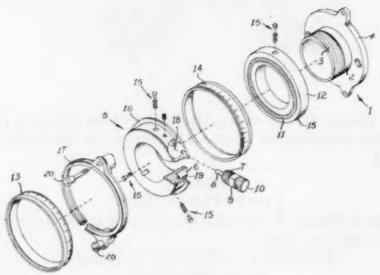
Robert Foglein, 7 Kym Ave., Valley View, Adelaide, Australia (5093)

Filed Mar. 13, 1973, Ser. No. 340,679

Claims priority, application Australia, Mar. 14, 1972, 8278/72

Int. Cl. B23q *17/00*

U.S. Cl. 116—115.5 **3 Claims**



A device for converting imperial measurements to metric measurements and vice versa and which is particularly suited to machine tools. The device has two revolving scales one for each system of measurement which are geared together so that simultaneous and instantaneous conversion takes place.

3,820,502

APPARATUS FOR FABRICATING WOODEN BUILDING FRAMES

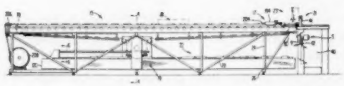
Adolfo Castillo; Oscar Csakvary, both of Miami, and John Calvin Jureit, Coral Gables, all of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Division of Ser. No. 25,536, April 3, 1970, Pat. No. 3,685,129.

This application Oct. 15, 1971, Ser. No. 189,642

Int. Cl. B05c *5/00, 11/14*

U.S. Cl. 118—6 **7 Claims**

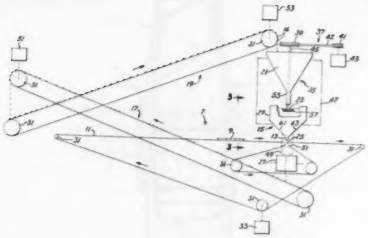


The apparatus includes a numerically controlled automatic measuring, sawing and marking device for cutting lumber to predetermined lengths, such parts comprising the non-standard length parts of a wall frame, and marking the lumber parts forming the top and bottom plates of the wall frame to indicate the locations along such plates of the frame parts extending between the plates. The machine readable numerical information representing the non-standard lumber lengths is converted into visible instructions for establishing the position of a lumber stop relative to a saw for making lumber cuts of predetermined lengths. Machine readable numerical information representing the locations along the top and bottom plates of frame parts extending between the plates in terms of distances along the top and bottom plates from like ends thereof is converted into visible instructions for establishing the position of the lumber stop relative to a marking device and for controlling actuation of the marking device. The non-standard parts are assembled with the standard parts to form a wall frame in accordance with the markings on the plates establishing the locations of the parts extending between the plates. The markings are also coded to indicate the location of windows, doors, and tee and corner constructions along the plates.

3,820,503
APPARATUS FOR DISTRIBUTING PARTICULATE MATERIAL

Harry A. Tabernacki, Wonder Lake, Ill., assignor to Kraft Corporation, Chicago, Ill.

Filed Apr. 20, 1972, Ser. No. 245,851
Int. Cl. B04b *3/02, 3/00*
U.S. Cl. 118—24 6 Claims

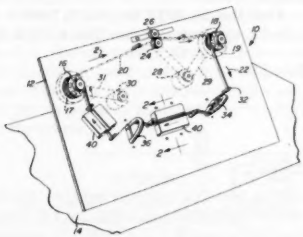


An apparatus is disclosed for coating a moving surface with particles in essentially a uniform pattern disposed generally transverse of the direction of movement of the moving surface and for automatically recovering any particles not applied to the surface during coating. Said apparatus comprises an impeller rotatable about its axis to propel the particles towards the walls of a non-cercular hopper so as to produce a substantially uniform disperson of particles on the surface.

3,820,504
TAPE CLEANING AND LUBRICATING APPARATUS

Alfred G. Dahl, 3635 Loma Vista, Flagstaff, Ariz. 86001

Filed Apr. 28, 1972, Ser. No. 248,612
Int. Cl. B05c *11/12*
U.S. Cl. 118—65 5 Claims

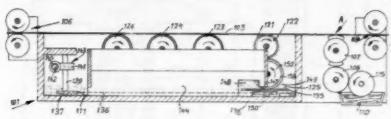


A cleaning and lubricating apparatus for magnetic tapes or the like, said apparatus comprising take-up and dispensing spool assemblies which handle the tape for passage over cleaning and lubricating heads and associated air squeegees or dryers. The cleaning and lubricating heads are each comprised of a tubular member with a liquid-dispensing wick disposed therein in wiping engagement with the tape at a notched area in the tubular member, and means for advancing the wick through a liquid reservoir to continuously replenish the liquid applied to the moving tape.

3,820,505
APPARATUS FOR APPLYING POWDER TO WEBS OF CIGARETTE PAPER OR THE LIKE

Manfred Goldbach, Hamburg-Bergedorf, and Willy Rudszinat, Dassendorf, near Hamburg, both of Germany, assignors to Hauni Werke Korber & Co. KG, Hamburg-Bergedorf, Germany

Filed Dec. 27, 1968, Ser. No. 787,537
Claims priority, application Germany, Jan. 13, 1968, 1657247
Int. Cl. B05c *1/08, 1/16*
U.S. Cl. 118—118 2 Claims

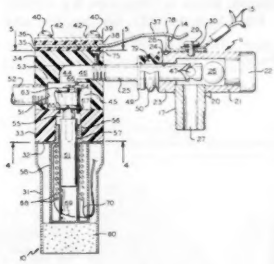


Bronze powder is applied to adhesive at the underside of a travelling web of cigarette paper by a pile on the periphery of a transfer roller receiving a thin layer of bronze powder from a conveyor which draws or receives a constant supply of powder from an intermediate supply. The latter is replenished from a main supply by a further conveyor.

3,820,506
PULSATOR FOR MILKING MACHINES

Lyall T. Conde, Sherrill, N.Y., assignor to Conde Milking Machine Co., Inc., Sherrill, N.Y.

Filed May 29, 1973, Ser. No. 364,249
Int. Cl. A01j *5/14*
U.S. Cl. 119—14.01 3 Claims



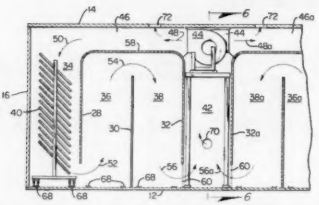
A stall cock has a rubber ball check valve in the passage connecting it to its vacuum line and an insulated contact electrically connected to one side of an electrical timer, the other side of the timer being connected to the vacuum line. The cooperating pulsator has a substantially cylindrical body manually graspable and with a radially projecting vacuum nipple for insertion in the stall cock and a spaced insulated contact finger adapted to hookedly engage the stall cock contact. An oppositely projecting control nipple leads from a central valve chamber and is adapted to be connected by flexible hose to the space between teat cup shell and inflation. The drum is secured to the plunger of a solenoid having its coil below the plunger and electrically connected at one end to the vacuum nipple and at the other end to the contact finger whereby the drum normally shuts off vacuum from the control nipple and connects vacuum to the control nipple when the solenoid is operated and the finger removably secures the pulsator to the stall cock.

3,820,507

APPARATUS FOR INCUBATING AND HATCHING EGGS

James G. Dugan, Littleton, Colo.; Albert S. Hancock, Jr., Orange City, Iowa; Gene W. Hausske, Palmer Lake, Colo.; Kenneth G. Huston; Bernard L. Rosenberg, both of Denver, Colo., and Shirley M. Smith, Littleton, Colo., assignors to Robbin Incubator Co., Denver, Colo.

Filed Jan. 21, 1972, Ser. No. 219,783
Int. Cl. A01k *41/00*
U.S. Cl. 119—35 7 Claims



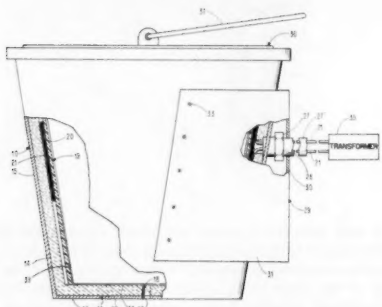
Process and apparatus for incubating and/or hatching eggs comprising a rectangular parallelepiped cabinet having an air conditioning bay or chamber, a plurality of parallel dolly bays adjacent one or both sides of the conditioning chamber, separated by impervious walls, and air ducting for delivering conditioned air flowing from the conditioning chamber to the dolly bays for serial flow therethrough and return to the conditioning chamber. The air flow path through adjacent bays may be in opposite vertical or opposite horizontal directions. Bay entry doors may be provided at one end or both ends of each bay.

3,820,508

DRINKING ARRANGEMENT FOR A HORSE

John R. Robinson, Route 2, Versailles, Ky. 40383

Filed Mar. 6, 1973, Ser. No. 338,454
Int. Cl. A01k *07/00*
U.S. Cl. 119—73 9 Claims



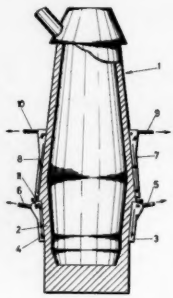
Drinking water for a horse is provided by supporting a removable bucket within a support bucket, which has a heat insulating jacket disposed therein with electrical heating means within the heat insulating jacket. This maintains the water in the removable bucket at a temperature at which it will not freeze when disposed in an unheated barn although a thin film of ice may form on the surface. A transformer reduces the current and voltage sufficiently to prevent electrocution of the horse if any electrical wire of the electric heating means should be exposed.

3,820,509

SHAFT FURNACE WITH EVAPORATION COOLING

Cornelis Van Der Vliet, Akersloot, Netherlands, assignor to Hoogovens Ijmuiden B.V., Ijmuiden, Netherlands

Filed Jan. 10, 1973, Ser. No. 322,471
Claims priority, application Netherlands, Jan. 11, 1972, 7200418
Int. Cl. F22b *37/00*
U.S. Cl. 122—6 R 8 Claims



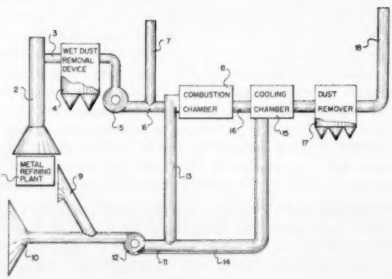
This invention relates to an improved shaft furnace of the type which over at least part of its outer surface is provided with a double wall, the space enclosed by said double wall being part of a circulation system for cooling liquid without pressure, there being a reservoir above the double wall space, in which evaporated cooling liquid can be separated from the cooling mixture, which reservoir is in direct open communication with the upper end of the double wall space, said space being divided into two spaces by an intermediary baffle being about parallel to the outer surface of the furnace, said two spaces being in open communication with each other at their upper and lower ends as set forth in U.S. Pat. application Ser. No. 190,745, filed Oct. 20, 1971, now U.S. Pat. No. 3,750,629.

3,820,510

METHOD AND APPARATUS FOR TREATMENT OF GASES

Pierre Vayssiere, Metz, France, assignor to Institut De Recherches De La Siderugie Francaise (IRSID), Saint-Germain-en-Laye, France

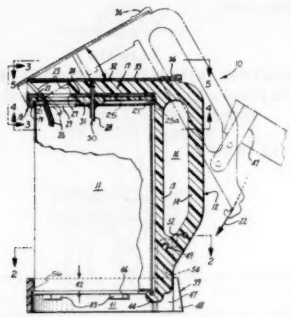
Filed Dec. 26, 1972, Ser. No. 317,939
Claims priority, application France, Jan. 4, 1972, 72.119
Int. Cl. F22b *1/18*
U.S. Cl. 122—7 R 8 Claims



A method and apparatus for treatment of gases from an oxygen steel plant in which the gases derived from the refining plant are collected without combustion, and are then burned in the presence of a corresponding stoichiometric amount of

gas from auxiliary pollution sources. The resultant burned gases are cooled with other gases from polluting sources, part of the recovered heat being reused, and the cooled gases are then subjected to a dust removal treatment and discharged.

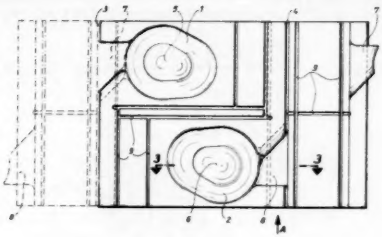
3,820,511
CAN HOLDING DEVICE FOR SERVING
John Katzakian, 3411 Arden Creek Rd., Sacramento, Calif. 95825
Filed June 22, 1972, Ser. No. 265,218
Int. Cl. A47g *19/14*
U.S. Cl. 222—475 **1 Claim**



A can holding device for serving from a can includes an elongate hand-grip member to be disposed alongside the can and having means for holding and pouring from the can held thereby. The device includes an annular movable base for substantially encircling the lower end of the can and for supporting the can in spaced relation with respect to support surfaces upon which the device may be disposed when serving. A connection is formed between the base and the lower end of the hand-grip member permitting movement of the base between advanced and retracted positions as well as provision of cam means carried by the base opposite the pivot connection and disposed to engage the can and urge the base away from the pivot connection to remove any looseness in the pivot connection so as to firmly retain the base beneath the can while permitting ready alignment of the base with the can. At the upper end of the device, a can opening element is carried beneath a cross-piece together with a tubular puncture element forming a vent therefor. The cross-piece serves as a lever including a fulcrum connection at one end thereof for engaging the bead formed around the edge of the can whereby the can may both be opened for serving and punctured for venting all in the same lever movement.

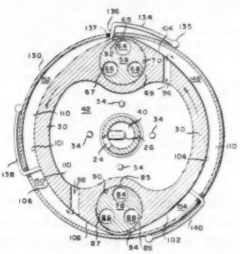
3,820,512
ROTARY PISTON ENGINE HAVING MIXTURE TURBULENCE CREATING PISTON CONFIGURATIONS
Huschang Sabet, D-7 Stuttgart 1, Eduard-Pfeiffer-Strasse 67, Germany
Continuation-in-part of Ser. No. 137,870, April 27, 1971, Pat. No. 3,736,080, Continuation-in-part of Ser. No. 284,896, Aug. 30, 1972, Pat. No. 3,779,215. This application Mar. 16, 1973, Ser. No. 341,988
Claims priority, application Germany, May 2, 1970, 2021640; Sept. 25, 1971, 7136462; Mar. 22, 1972, 2213964
Int. Cl. F02b *55/02*
U.S. Cl. 123—8.13 **5 Claims**

In a rotary piston engine in which two pairs of rotary pistons rotate about the axis of a cylindrical casing, one pair moving at uniform angular velocity, the other pair at cyclically varying velocity so that chambers between radially extending faces of circumferentially adjacent pistons expand and contract. The casing is formed with intake and exhaust ports and may carry a spark plug for igniting a fuel mixture previously drawn into an expanding chamber and compressed in the contracting chamber, and the pistons of the two sets have circumferential faces of different width sealingly engaging the inner casing wall. The wider circumferential piston faces each have two,



axially offset, dish-shaped recesses having respective flaring orifices in the two radially extending piston faces. The two recesses respectively sweep the intake and exhaust ports of the casing during engine operation, and circumferential projections of the pistons of the other set are approximately conformingly received in the orifices whenever one piston of one set is contiguously adjacent a piston of the other set.

3,820,513
ROTARY ENGINE
Otto A. Buettner, P.O. Box 398, Daleville, Ala. 36322
Filed May 24, 1972, Ser. No. 256,348
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.17 **16 Claims**

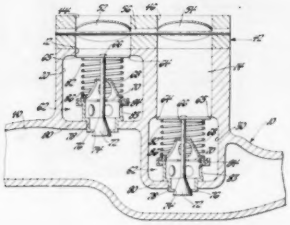


An internal combustion engine has a plurality of rotating chambers disposed and turning within a rotor and which are successively connected to compression and expansion channels on the peripheral surface of the rotor which, together with the interior annular surface of the housing and depending gate valve elements form compression and expansion chambers as the rotor turns.

ERRATUM

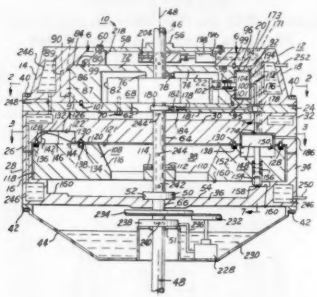
For Class 123—32 see:
Patent No. 3,820,198

3,820,514
EXHAUST GAS RECIRCULATION CONTROL
Paul B. Kuehl, South Bend, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 29, 1973, Ser. No. 346,073
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 A **5 Claims**



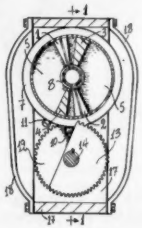
A control valve assembly, responsive to induction passage mass air flow, controls recirculation of exhaust gases from the intake manifold exhaust crossover passage to the intake manifold induction passages.

3,820,515
ROTARY MOTOR MEANS
Boris Knisch, Estelle Manor, N.J., assignor to Knisch Enterprises, Inc., Vineland, N.J.
Filed May 22, 1972, Ser. No. 255,555
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.41 **15 Claims**



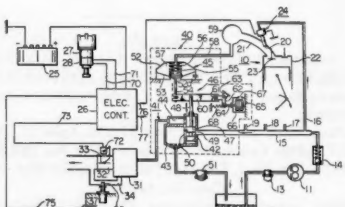
A rotary motor means comprising a casing having a first portion providing a first cavity therein with a plurality of first indented regions and a second portion providing a cavity therein with a second plurality of indented regions, a first rotor unit supported for rotary movement within the first cavity of the casing proximate to the first indented regions for providing a respective plurality of compression chambers, a second rotor unit supported for rotary movement within the second cavity of said casing proximate to the second indented regions for providing a plurality of combustion chambers, a plurality of first blade elements movably supported by said first rotor unit, for being sequentially received into the compression chambers with the rotation of the first rotor unit, means for delivering to the compression chambers of said casing fluids for being compressed therein by the first blade elements, and means for delivering the compressed fluids from the compression chambers in predetermined timed sequence to respective combustion chambers for providing a combustible mixture in said combustion chambers for propelling the second blade elements during combustion and expansion of said mixture, and thereafter removing from said chambers the combustion products, the number of combustion chambers in the second portion of the casing exceeding the number of second blade elements while the number of compression chambers equal the number of combustion chambers and the number of first blade elements equal the number of second blade elements, and the angular disposition of the compression chambers with the combustion chambers, and the first blade elements with the second blade elements are respectively adjustably fixed.

3,820,516
ROTATING INTERNAL COMBUSTION ENGINE
Constantin Paleologos, 14 Navarinow St., Athens, Greece
Filed July 15, 1971, Ser. No. 129,711
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.47 **1 Claim**



A four piston rotary internal combustion type engine, with diametrically opposite pistons in pairs, each pair fixed on each one of two toothed disks, the later alternately in mesh with two sectional gears, mounted on a shaft (the output shaft) for controlling disks' i.e. pistons' movement and for transmitting the energy.

3,820,517
FUEL INJECTION SYSTEM
Shyuya Nambu, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Continuation-in-part of Ser. No. 99,335, Dec. 18, 1970, abandoned. This application Dec. 27, 1972, Ser. No. 318,999
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA **4 Claims**



A fuel injection system for a multi-cylinder interal combustion engine, including a fuel pump adapted to be driven by the engine so as to increase the pressure of fuel to be injected for each cycle of the engine operation in substantially propor-

tion to an increase in the engine speed, and an electronic control circuit adapted to produce a fuel injection pulse signal having a pulse width decreasing in proportion to an increase in the engine speed, by which the quantity of fuel to be injected for each cycle of the engine operation remains substantially unchanged irrespective of the variations in the engine speed.

3,820,518

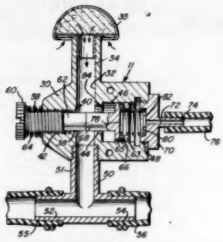
AUTOMATIC MANIFOLD VACUUM SPOILER

James J. Dolfi, Sr., P.O. Box 434, Torrance, Calif. 90508

Filed Aug. 28, 1972, Ser. No. 284,271

Int. Cl. F02m *25/06*

U.S. Cl. 123—119 B **6 Claims**



A valve body having an airflow passage formed therethrough and a second passage also formed therein intersecting with the first passage and extending transversely thereof. One end of the second passage has an abutment member mounted therein for adjustable positioning therealong with the abutment projecting at least slightly into the first mentioned passage. The other end of the second passage has a spring-urged piston slidable therein and biased toward abutting engagement with the end portion of the abutment projecting into the first passage, the two passages being substantially of the same diameter whereby abutment of the piston with the abutment member will at least substantially close the first mentioned passage. The end of the piston remote from the abutment member is slidable within a cylinder cavity subject to manifold vacuum of an internal combustion engine and the first mentioned passage communicates the interior of the air cleaner of an associated combustion engine with a positive crankcase ventilation system of the engine.

3,820,519

PNEUMATIC RPM REGULATOR FOR FUEL INJECTION PUMPS

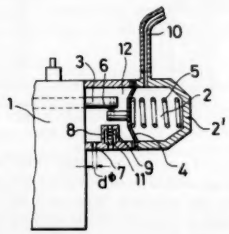
Toshi Suda, Nagoya, and Takuji Isomura, Toyota, both of Japan, assignors to Nippondenso Co. Ltd., Kariya Shi, Aichi Ken, Japan

Filed Oct. 2, 1972, Ser. No. 293,831

Claims priority, application Japan, Oct. 2, 1971, 46-90692

Int. Cl. F02d *1/04*

U.S. Cl. 123—140 MP **1 Claim**



The fuel rack of a fuel injection pump is controlled by the motion of a diaphragm which separates a vacuum chamber communicating with a venturi in the air intake tube of an internal combustion engine from an additional chamber communicating with the ambient atmosphere through a continuously open throttle bore and an inwardly opening check valve.

3,820,520

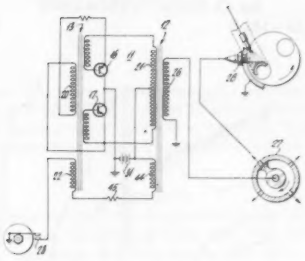
HIGH FREQUENCY TYPE IGNITION SYSTEM

Robert E. Canup, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 87,549, Nov. 6, 1970, abandoned, and a continuation-in-part of Ser. No. 193,909, Oct. 29, 1971. This application May 30, 1972, Ser. No. 257,952

Int. Cl. F02p *3/02*

U.S. Cl. 123—148 E **15 Claims**



A high-frequency ignition system which employs electromagnetic feedback with a control winding applying at least partial saturation to stop and start oscillations. It employs an improved combination to apply magnetic bias to part of the magnetic feedback circuit in order to overcome the possibility of a failure to start the oscillator upon de-energization of the control winding. It may also include a semiconductor in the control winding circuit for insuring a desired polarity of the last half-cycle of AC current.

3,820,521

VEHICLE IGNITIONS SYSTEMS

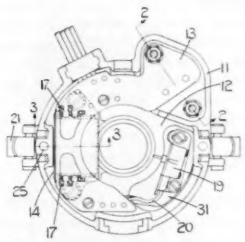
John Longstaff-Tyrrell, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 11, 1971, Ser. No. 197,837

Claims priority, application Great Britain, Nov. 17, 1970, 54570/70

Int. Cl. F02p *3/02*

U.S. Cl. 123—148 E **8 Claims**



A conversion kit for use with a standard ignition system has a plate adapted for connection to the housing of a conventional distributor. On the plate are a pair of windings, and there is a control device adapted for connection to the engine driven shaft which runs through the distributor. The control device incorporates magnetic mean which when the plate and

control device are in position couple the windings magnetically whenever a spark is required, and an electronic control circuit, of which said windings form part, is provided for controlling current flow in the primary winding of the ignition coil. The conversion kit allows the normal contact breaker to be dispensed with.

3,820,522

VALVE SEAT FOR THE INLET VALVE IN THE CYLINDER HEAD OF A FOUR-CYCLE INTERNAL COMBUSTION ENGINE

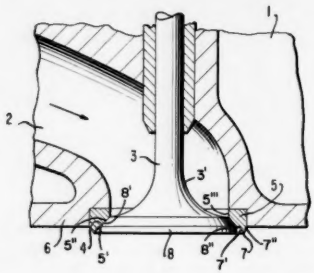
Hans O. Scherenberg, Stuttgart-Heumaden, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Jan. 23, 1970, Ser. No. 5,183

Claims priority, application Germany, Jan. 24, 1969, 1903436

Int. Cl. F01l *3/00*; **F02m** *29/00*

U.S. Cl. 123—188 S **22 Claims**



A valve seat for the inlet valve in the cylinder head of a four-cycle internal combustion engine in which the valve seat is provided with a sharp edge projecting into the combustion space in the axial direction of the inlet valve as a detaching step surrounding the valve disk of the inlet valve for any fuel components precipitated along the walls of the inlet channel.

3,820,523

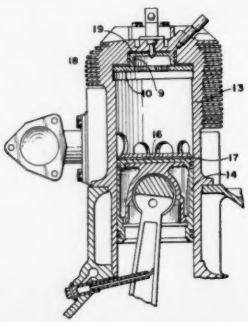
INTERNAL COMBUSTION CHAMBER

Merle Robert Showalter, 4733 Shoremeade Rd., Richmond, Va. 23234, and Samuel Rhine, R.F.D. 424A, Tillson, N.Y.

Filed Mar. 8, 1973, Ser. No. 339,158

Int. Cl. F02b *23/00*

U.S. Cl. 123—191 A **7 Claims**



An insulator which may be ceramic or glass is bonded to the simple surfaces of an internal combustion engine combustion chamber by means of an intermediate layer of relatively elastic material which mediates the differential expansion between the insulator and the underlying combustion chamber supporting surfaces.

3,820,524

COOKING OVENS

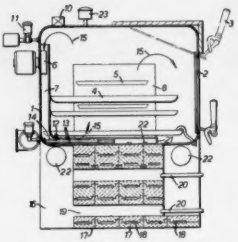
Raymond Albert Buckell, 41 Belmont Crescent, Maidenhead, Berkshire, England

Continuation-in-part of Ser. No. 150,978, June 8, 1971, abandoned. This application Feb. 15, 1973, Ser. No. 332,565

Claims priority, application Great Britain, June 8, 1970, 27699/70, Great Britain, Sept. 28, 1970, 4605/70

Int. Cl. A21b *1/24*

U.S. Cl. 126—20 **8 Claims**



This invention is an oven particularly for heating frozen foods quickly by means of a gaseous vapour at superatmospheric pressure. Preferably steam is raised within the oven by applying water to a heated body and the atmosphere in the oven is circulated by a fan in heat-exchange relationship with the heated body. The water is applied at the centre of the heated body so that it is flashed rapidly into steam and also any water condensing on the sides of the oven is arranged to run down and back to the heated body for reflashing.

3,820,525

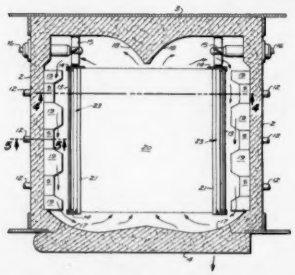
RADIATION AND CONVECTION HEATED OVEN

John E. Pond, 17238 Barneston St., Granada Hills, Calif. 91344

Filed Aug. 10, 1973, Ser. No. 387,325

Int. Cl. A21b *1/06*

U.S. Cl. 126—21 A **7 Claims**



A radiation and convection heated oven in which infrared radiant heat is generated by one or more sets of coplanar positioned heaters, the radiation from each set of heaters being directed through a transparent reradiating panel, such as a fused quartz panel, forming a wall of an oven chamber. The oven chamber is provided with a plurality of shelves also transparent to the radiant heat and supporting heat absorbing containers. The radiation passing into the oven chamber being

distributed in an essentially uniform pattern by reflecting surfaces for absorption by the containers as well as the exposed surfaces of food contained therein. Simultaneously, air is circulated past the set or sets of heaters and the transparent panels and around the food containers to control excess radiant temperatures and supplement the radiant heat applied to the food.

3,820,526

AIR HEATER, ESPECIALLY FOR CONNECTION TO A CENTRAL HEATING SYSTEM

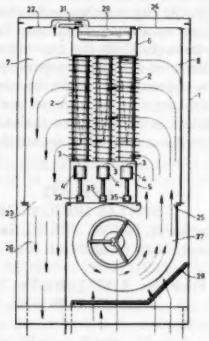
Cors Van Vliet, Zwolle, Netherlands, assignor to N.V. Werktuigenfabriek Mulder, Kampen, Netherlands

Filed May 23, 1972, Ser. No. 256,077

Claims priority, application Netherlands, May 24, 1971, 7107090

Int. Cl. F24h *3/08*

U.S. Cl. 126—110 R **5 Claims**



Gas fired air heater for a central heating system comprising a heat exchanger in which are arranged a series of parallel rows of vertical heat exchange tubes, the lower ends of which are connected to a joint burner compartment and the upper ends of which are connected to a joint flue compartment. Two opposite lateral sides of the heat exchanger are connected to air supply and discharge compartments respectively for feeding the air to be heated transversely through the heat exchanger. The lateral air supply and discharge compartments have air inlet and outlet connections at their top and bottom walls only. One of said lateral air compartments is closed at one end and is connected to a fan at the opposite end, whereas at least one end of the other lateral air compartment is connected to a main duct for discharge of the heated air. The heat exchange tubes are grouped in three sections, each of which extends transversely to the direction of flow of the air to be heated and each of which is heated by an individual ribbon type burner. Each section is individually controlled, to which end the individual sections may be connected to the successive stages of a multistage room thermostat set at staggered temperatures.

3,820,527

INDOOR COMBUSTION UNIT

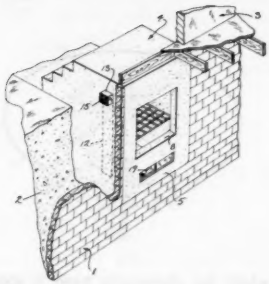
Thomas C. Koch, 2909 Birch St., La Crosse, Wis. 54601

Filed Apr. 23, 1973, Ser. No. 353,559

Int. Cl. F24b *1/18*

U.S. Cl. 126—137 **10 Claims**

A present concrete exterior unit such as step or planter unit for a home is constructed as a hollow unit with top, bottom and side walls and with the lower portion extended downwardly below the frost line and into the basement level. An appropriate opening in the basement wall exposes the interior of the hollow unit, which is provided with a grill and a charcoal chamber beneath the grill. An air duct is integrally formed in the sidewall of the unit with an air inlet located above the ground line and with an air discharge extending in



the opposite direction into the combustion chamber. The opposite sidewall of the unit includes an air exhaust fan located above the ground line to provide a forced removal of air, grease and other foreign matter as the result of combustion.

3,820,528

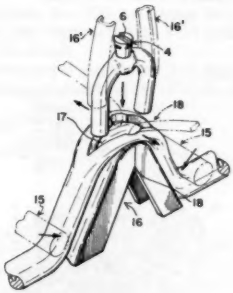
SURGICAL METHOD FOR STERILIZATION

William P. Rogers, 6312 Senate, Little Rock, Ark. 72109

Filed Feb. 10, 1972, Ser. No. 225,253

Int. Cl. A61b *19/00*

U.S. Cl. 128—1 R **5 Claims**



This invention relates to the design, manufacture, and installation procedures for accomplishing a reversible male sterilization operation through the implanting of tiny, especially designed plastic valve assembly in the tubes of the vas deferens through the use of a special installing device. The plastic valve assembly, the method of manufacture and installation of same, and the special installing apparatus make up this invention.

3,820,529

CONDUCTIVE ELASTOMERIC EXTENSOMETER

Raymond L. Gause, Huntsville, and C. G. Glenn, Arab, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

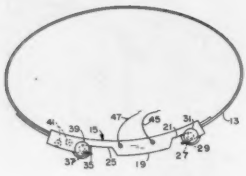
Filed Nov. 7, 1972, Ser. No. 304,430

Int. Cl. A61b *5/10*

U.S. Cl. 128—2 S **3 Claims**

An extensometer for measuring surface area changes of the human body caused by expansion and contraction of the body

comprising a relatively thin and wide strain responsive conductive elastomeric band adapted for application to a part of the body, such as around a limb or the trunk of the body. The elastomeric band is incorporated as a resistor in a balanced bridge circuit. Expansion or contraction of the portion of the

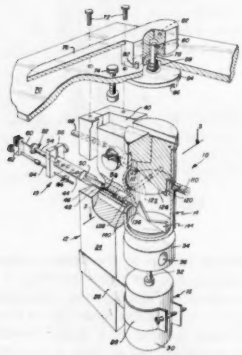


body on which the elastomeric band is applied causes a change in the resistance of the band and a resultant imbalance of the bridge circuit generating an output that is fed into an amplifier. The output of the amplifier in volts is suitable for providing the desired reading through a recorder, oscilloscope or voltmeter.

3,820,530
CARDIAC OUTPUT MEASURING METHOD AND APPARATUS

Saul R. Gilford, Oberlin; Gary M. Freeman, Grafton, and John H. Bauman, Berea, all of Ohio, assignors to Gifford Instrument Laboratories, Inc., Oberlin, Ohio

Filed Feb. 16, 1973, Ser. No. 332,929
Int. Cl. A61b *5/02*; **G01t** *1/16*
U.S. Cl. 128—2.05 F **27 Claims**



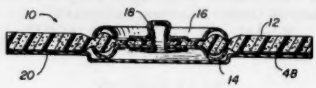
Apparatus and method for practicing the Stewart-Hamilton method of measuring cardiac output but with dynamic calibration.

The apparatus includes a chamber into which a precise quantity of dye can be introduced for admixture with blood in the chamber. The flow of a subject's blood can then be switched from normal measuring flow through the densitometer to calibrating flow through the densitometer by a simple mechanical operation without stopping the procedure and without need for sterilization of any apparatus or changing of any equipment. An important component of the apparatus is a combined mixing chamber and cuvette which is disposable.

3,820,531
MEDICAL ELECTRODE

Roman Szpur, Dayton, Ohio, assignor to NDM Corporation, Dayton, Ohio

Continuation of Ser. No. 259,563, June 5, 1972, Pat. No. 3,713,435, which is a continuation of Ser. No. 11,208, Feb. 13, 1970, Pat. No. 3,696,807. This application Jan. 30, 1973, Ser. No. 328,000The portion of the term of this patent subsequent to Oct. 10, 1989, has been disclaimed.
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 E **4 Claims**

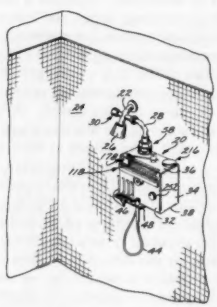


An electrode for attachment to the skin is made from an adhesively coated, elastic sheet sandwiched between a non-conducting, low profile cup member and a clamp plate fixed in assembled relation by a conductive snap fastener member extending therethrough. Both the cup member and the clamp plate are in the form of cavity washers, the confronting margins of which squeeze the sheet. In use, the cup member cooperates with the skin to form an enclosed cavity for an electrolyte. When pressed against the skin, the elastic sheet resiliently urges the cup member against the skin.

3,820,532
DENTAL IRRIGATOR

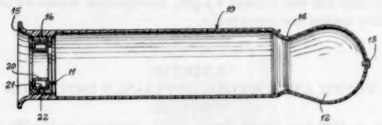
Roland C. Eberhardt, 564 W. 39th St., San Pedro, and Joseph W. Whisenant, 3646 Long Beach Blvd., Los Alamitos, both of Calif.

Filed Nov. 8, 1972, Ser. No. 304,861
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **20 Claims**



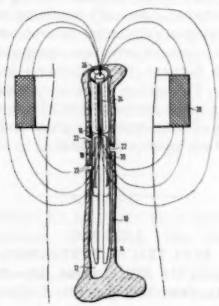
A water operated dental irrigator comprising a housing having a discharge passage communicating at one end with a pressurized water supply and at the other with a discharge hose and nozzle, and a water driven turbine wheel operating an interruptor valve in the discharge passage to produce an unlimited volume of discrete pulses of pressurized water through the hose. The turbine speed is variable through actuation of adjustable control nozzles which eject pressurized water to drive the turbine, and a metering valve controls the intensity of the pulsed water by controlling the amount of water admitted to the discharge passage from the supply. A chamber in the housing communicating with the supply and the discharge passage allows an oral antiseptic to be dispensed into the discharge passage between pulses.

3,820,533
SURGICAL DEVICE
Augustin Jones, 9707 Conway Rd., Ladue, Mo. 63124
Filed Aug. 2, 1971, Ser. No. 168,188
Int. Cl. A61f 5/00
U.S. Cl. 128—79 4 Claims



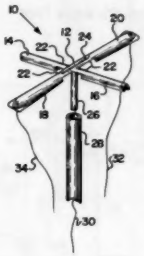
A device for aiding men to attain and maintain erection consisting of an inflatable ring adapted to be inserted around the base of the penis and then inflated so as to apply a radially inward force thereto sufficient to retain blood in the organ; and a tubular sleeve portion with a bulb integrally formed thereon, that can be inserted over the penis and secured about the ring element in sealing engagement therewith, whereupon the bulb can be actuated to develop a low pressure within the interior of the tube and outside the penis, to aid in causing an erection, the ring retaining the blood to maintain the erection, the tubular part then being removable to permit copulation. After copulation, the ring can also be used in preventing urinary incontinence in males.

3,820,534
DEVICE FOR PROMOTING THE FORMATION OF BONE SUBSTANCE
Werner Kraus, Munich; Fritz Lechner, Garmisch-Partenkirchen, and Hans-Dieter Viehbach, Aisingerwies, all of Germany, assignors to Werner Kraus, Munich, Germany
Filed Apr. 6, 1972, Ser. No. 241,728
Claims priority, application Germany, Apr. 6, 1971, 2116869
Int. Cl. A61n
U.S. Cl. 128—82.1 12 Claims



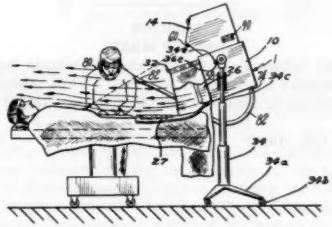
A splint for fixing a bone structure in position is in the form of a marrow nail, of which at least a part is constructed to serve as an electrode. The electrode is connected to a first terminal end of a pick-up coil. The second terminal end of the coil is connected to a second electrode which may be also attached to the marrow nail or is fixed to a belt-like carrier adapted to be tightened around the bone structure.

3,820,535
INTRAUTERINE DEVICE
John L. Marco, 601 Dow Ave., Oakhurst, N.J. 07755
Filed Oct. 25, 1972, Ser. No. 300,651
Int. Cl. A61f 5/46
U.S. Cl. 128—130 6 Claims



An intrauterine contraceptive device has a central body portion with legs or ribs projecting radially therefrom and presenting a three-dimensional configuration. The ribs are hinged to the central body portion and collapse in the manner of a parasol to provide a linear two-dimensional unit for insertion of the device into the uterine cavity. A portion of the device, such as the central body portion, may be formed of a ball chain of heavy metal to increase the contraceptive efficiency of the device.

3,820,536
APPARATUS FOR PROVIDING CLEAN AIR AT A SURGICAL AREA
William E. Anspach, Jr., 723 Anchorage Dr., North Palm Beach, 33408, and Marinus Bakels, 1721 Ardley Rd., Juno Isles, both of Fla. 33408
Continuation-in-part of Ser. No. 216,591, Jan. 10, 1972, abandoned. This application Dec. 11, 1972, Ser. No. 313,977
Int. Cl. A61b 19/00
U.S. Cl. 128—132 12 Claims



This invention relates to both a method and apparatus for providing a laminar flow of clean air through a removal sterile nozzle, having a removable sterile drape therearound, across the surgical area during an operation. The new method constitutes discharging a flow of virtually sterile air at a velocity of between approximately 350 and 800 fpm across the surgical area from a distance of approximately 2 to 5 feet thus producing a barrier zone across the wound surface to prevent contamination from the surrounding air and the surgical team. The apparatus includes a blower, housing, nozzle, drape means, pre-filter means, a pressure plenum, and a High Efficiency Particulate Air Filter (HEPA) capable of discharging, at a velocity of between 350 and 800 fpm, a laminar flow of "clean" air.

3,820,537
SELF-CONTAINED UNDERWATER BREATHING APPARATUS (SCUBA)

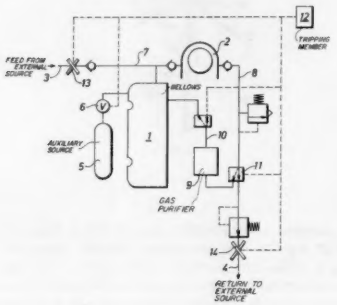
Hans Olof Almqvist, Lidingo, and Imre Botos, Bromma, both of Sweden, assignors to AGA Aktiebolag, Lindingo, Sweden

Filed June 15, 1972, Ser. No. 263,319

Claims priority, application Sweden, June 22, 1971, 8120/71

Int. Cl. A62b *7/04*

U.S. Cl. 128—142.2 **7 Claims**



An emergency self-contained underwater breathing apparatus (SCUBA) for supplementing a diver's normal gas supply system and adapted to be switched on in response to failure of the gas feed from the normal system. This emergency unit comprises an auxiliary source of gas connected through a normally closed outlet valve to a through-flow storage provided with the inhalation and exhalation conduits extending to the diver's helmet. On failure of the gas feed from the normal system, the outlet valve of the auxiliary source of gas will open causing the contents of gas under pressure in said source to be emptied into said through-flow storage, thereby forming a closed breathing circuit comprising the through-flow storage, the inhalation and exhalation conduits and the diver's helmet. The inhalation conduit has a gas purifier inserted in it.

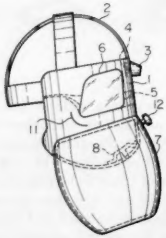
3,820,538
SAFETY MASK

Motoyoshi Nakanishi, 11-13 Homach, 4, Funabashi, Japan

Continuation of Ser. No. 95,929, Dec. 7, 1970, abandoned. This application Mar. 12, 1973, Ser. No. 340,291

Int. Cl. A62b *7/02, 3/00*

U.S. Cl. 128—142.2 **2 Claims**



An improved safety mask for an emergency refugee, which broadly comprises a mask body member having upper and lower inside portions mutually segregated by a transverse protrusion extending substantially from the human nose septum to cheekbones, and an oxygen container secured at a lower portion of the body member. The oxygen container is intermittently connected with the inside lower portion of the body member through an oxygen suction valve provided at the central bottom of the body member, which valve is operative to open and shut automatically in response to an inhalation and exhalation of the mask wearer. For the exhaust of the wearer's exhalation, slits are provided about such portions of the body member as corresponding to the human cheek portions, and for the wearer's sight, transparent windows and a lighting means are provided.

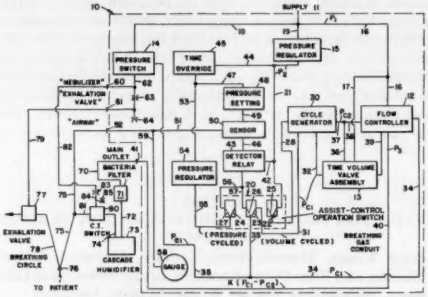
3,820,539
VENTILATOR WITH COMPLIANCE ISOLATION SWITCH

Louis A. Ollivier, Menlo Park, Calif., assignor to Veriflo Corporation, Richmond, Calif.

Continuation-in-part of Ser. No. 299,148, Oct. 19, 1972, abandoned. This application Oct. 1, 1973, Ser. No. 402,258

Int. Cl. A61m *16/00*

U.S. Cl. 128—145.8 **8 Claims**



A ventilator apparatus having (1) a main outlet which supplies breathing gas during each inspiratory phase and supplies none during each expiratory phase, (2) a pressure switch that provides gas under pressure during each inspiratory phase and is cut off and bled to atmosphere during each expiratory phase, is connected to a patient's breathing circle via a series of elements having a substantial volume and a substantial compliance. The present invention interposes a compliance isolation switch between these elements and the patient's breathing circle. This switch has a control means connected by a control line to the pressure switch for opening the switch at the beginning of each inspiratory phase and for closing it at the beginning of each expiratory phase.

3,820,540
ELECTRICAL APPLIANCE

Hans Hirtz, Bonner Str. 180, Cologne, Bayenthal, and Hanns-Joachim Hirtz, Peter-Berchem Str. 5, Cologne, Deckstein, both of Germany

Filed July 6, 1972, Ser. No. 269,315

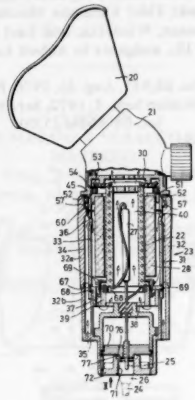
Claims priority, application Germany, Dec. 7, 1971, 2160561

Int. Cl. A61m *15/00*

U.S. Cl. 128—212 **25 Claims**

A first component of the appliance has a first section an annular wall of which surrounds a chamber within which a heating element is located. A second component includes a cupped face mask which is to be placed against the face of the user and a second section communicating with the interior of

the mask via suitable passages, and having an annular fluid-storage absorbent element of porous material. The sections



are telescoped together and can be axially separated, for facilitating access to the fluid-storage element and heating means.

3,820,541

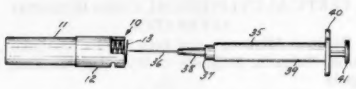
SHIELD FOR HYPODERMIC SYRINGE

James Langan, 100 Glenroe Dr., Baltimore, Md. 21228

Filed Sept. 11, 1972, Ser. No. 287,719

Int. Cl. A61m *5/00*; **A61b** *6/10*

U.S. Cl. 128—215 **2 Claims**



A shield for a hypodermic syringe adapted to surround the barrel thereof to protect the user against radiation emanating from radioactive fluids contained therein. The shield is lead-lined, and is provided with a bayonet fitting element engaging the manually engaged end of the syringe. A coil spring cooperates with the bayonet fitting element to prevent wobbling between the barrel of the syringe and the barrel of the shield. The barrel of the shield is so configured that a small end of the barrel of the syringe is uncovered to permit visual inspection of flow to and from the syringe.

3,820,542

INTRAMUSCULAR INJECTION DEVICES

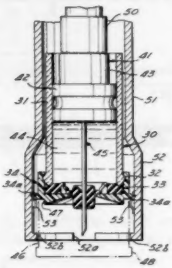
Alfred A. Hurschman, Streetsboro, Ohio, assignor to Ampoules, Inc., Macedonia, Ohio

Division of Ser. No. 114,493, Feb. 11, 1971, Pat. No. 3,735,761. This application Aug. 24, 1972, Ser. No. 283,505

Int. Cl. A61m *5/24*

U.S. Cl. 128—218 DA **4 Claims**

An intramuscular injection ampoule of the contained-needle type and a combination of such an ampoule with a so-called "applicator" for actuating the ampoule to make injections are disclosed. The ampoule has at least one cylindrical, medicament-containing chamber and a plunger closing one end thereof. A hollow needle is fixed to the plunger and is initially contained within such a chamber. The other end of the ampoule is sealed by a diaphragm. The ampoule is only partially filled with a medicament so that the needle may be advanced through the diaphragm to a preinjection position. The ampoule is then positioned in an applicator and is retained therein by releasable spring clips. A spring-loaded force-ap-



plying member drives the ampoule past the clips so that the needle enters the patient's muscle and then the plunger is moved relative to the cylinder to inject the medicament.

3,820,543

DERMATOME WITH A RECIPROCABLE KNIFE

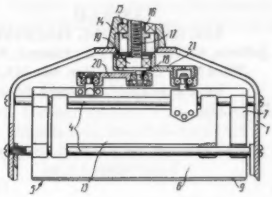
Sergei Petrovich Vanjushin, Zvezdny bulvar 30, korpus 1, kv. 46, and Leonid Fedorovich Bandakov, Urzhumskaya ulitsa, 3, korpus 3, kv. 366, both of Moscow, U.S.S.R.

Filed July 14, 1972, Ser. No. 271,651

Claims priority, application U.S.S.R., Oct. 15, 1971, 1705274

Int. Cl. A61b *17/322*

U.S. Cl. 128—305 **4 Claims**



The dermatome includes a knife assembly for cutting away a skin transplant, reciprocable along guides mounted in the housing. The knife is operatively connected through a connecting rod with an eccentric crank means associated with a drive shaft extending through the handle. To counterbalance the forces generated by the reciprocation of the knife assembly in operation and capable of vibrating the housing, a counterweight is provided which is reciprocable along the guides in the direction that is always opposite to that of the motion of the knife assembly. The dermatome further includes means for limiting the width of the skin transplant being cut away and means for adjusting the thickness of the skin transplant being cut away.

3,820,544

DEVICE FOR EFFECTING TEMPORARY STERILISATION

Kurt Semm, Hegewischstrasse 4, 2300 Kiel, Germany

Filed June 29, 1973, Ser. No. 374,894

Claims priority, application Germany, Jan. 9, 1973, 2300840

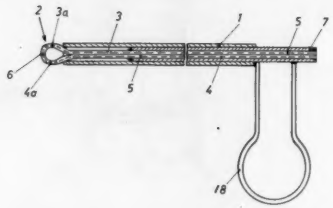
Int. Cl. A61b *17/30, 17/10, 17/12*

U.S. Cl. 128—326 **7 Claims**

A surgical device for effecting temporary sterilisation of females by binding the Fallopian tubes is described, which in-

strument comprises a barrel and an implement at the distal end thereof and which can be operated from the proximal end thereof.

In accordance with the invention, the implement referred to consists of a pair of grips which have arms openable and closable and curved so as to be able to surround a Fallopian tube: a



passage is provided through the barrel to receive a binding element such as a thread or other filament, or a strip, and this binding element passes through the gripping arms when they are in their normally closed state. Preferably, although not necessarily, the passage referred to begins and ends in the proximal section of the instrument.

3,820,545

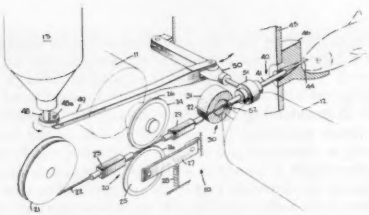
TAG IMPLANTING MACHINE

Keith B. Jefferts, 82 Blackburn Rd., Summit, N.J. 07901

Filed Mar. 26, 1973, Ser. No. 345,102

Int. Cl. A61b *17/00*; **A01k** *61/00*

U.S. Cl. 128—330 **16 Claims**



A method and apparatus are disclosed for implanting identifying tags into a macro-organism so that its movement from one habitat to another may be studied. A supply of wire is incrementally advanced by means of a drive motor along a substantially straight path through a cutting and implanting means. The cutting means serves to cut a short length of wire suitable for implantation from the length of wire, the cut length then by means of the remaining uncut wire being advanced to the impanting means. The implanting means includes a reciprocating hypodermic needle through which the cut segment of wire is advanced by the supply of wire and implanted in the macro-organism.

3,820,546

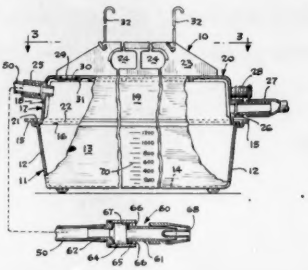
COMBINED AIR VENT, FILTER AND ADAPTER FOR URINARY DRAINAGE ASSEMBLIES

Richard Marion Chittenden, Grayslake; Aldean William Whitton, Northbrook; Fidel Vallaluna Macalalad, Lake Forest; Richard Massman, Winnetka, and Earl David Wilson, Ingleside, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 66,951, Aug. 26, 1970, Pat. No. 3,640,315. This application Sept. 1, 1972, Ser. No. 285,711

Int. Cl. A61m *25/00*

U.S. Cl. 128—349 **6 Claims**



A combined air vent, filter and adapter for connecting a urinary drainage catheter to a collection container is disclosed. The combined device comprises two tubular extensions joined by a cylindrical chamber of larger diameter than the tubular extensions and having an opening therein through which air can pass. The opening is covered with a filtering material of a pore size selected to filter bacteria from the air entering it.

3,820,547

VERTICAL CYLINDRICAL CORN HUSKING APPARATUS

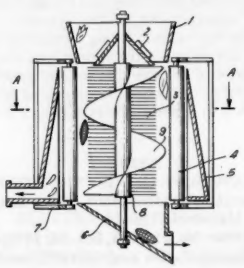
Venko Dimitrov Mladenov, and Ivan Vasilev Maslinkov, both of Sofia, Bulgaria, assignors to DSO Agromachina, Sofia, Bulgaria

Filed Apr. 2, 1973, Ser. No. 347,358

Claims priority, application Bulgaria, Apr. 3, 1972, 20130

Int. Cl. A01f *11/06*

U.S. Cl. 130—5 B **3 Claims**



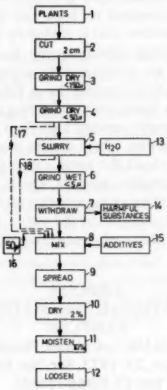
Corn husking apparatus of the vertical type having husking roller pairs and baskets for the husked ears and the stem and leaf mass. Pairs of husking rollers are annularly disposed and are enclosed on the outer side by a casing for the leaf and stem mass. In the cylindrical space formed inside, between the rollers, on there is mounted a cylindrical pressing brush combined with a screw and fastened to the upper end of the axle

there is a conical distributor with inclined blades. Ears to be husked are fed into a hopper fastened to the upper part of the frame of the apparatus, and in the lower part of the frame there is a bucket with an inclined bottom for the receiving husked ears.

3,820,548
METHOD OF MAKING A TOBACCO SUBSTITUTE MATERIAL

Paul Buchmann, Basel, Switzerland, and Monique Beringer, Saint Louis, France, assignors to Tamag Basel AG, Basel, Switzerland

Filed Nov. 1, 1971, Ser. No. 194,654
Claims priority, application Luxembourg, Nov. 3, 1970, 61985
Int. Cl. A24b *03/14, 15/00*
U.S. Cl. 131—2 **1 Claim**



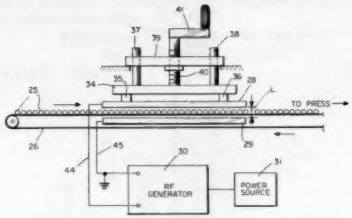
A tobacco substitute is prepared by dry-grinding pieces of nonwoody or low-wood plants to a particle size below 150 microns, thereafter wet-milling the powder to produce a slurry with a particle size of the powder below 50 microns, adding a binder such as sodium carboxymethyl cellulose to the mixture together with a plasticizer and, possibly, mineral fibers and burning controllers. The slurry is cast into a film and dried, preferably with after-moisturization to a final moisture content of the foil between 1 and 15 percent by weight. Any toxic substances contained in the botanicals are removed by steam distillation or solvent extraction prior to forming the composition into a dried film.

3,820,549
APPARATUS AND METHOD FOR RADIO FREQUENCY STERILIZATION OF CIGARS

Donald E. Flinchbaugh, York, Pa., assignor to ExCel Engineering Incorporated, Red Lion, Pa.

Filed Nov. 30, 1972, Ser. No. 310,766
Int. Cl. A24c *01/38*
U.S. Cl. 131—121 **7 Claims**

Cigars are passed through a radio frequency field and exposed to heating from said field of a specific intensity and for a specific time duration so as to sterilize the cigars without overheating them. The center of each cigar is brought to a temperature within the range of 140°F to 180°F and heated for 4 to 15 seconds by the RF field. While under the influence of the heat, the cigars may be pressed and pierced.



3,820,550
TREATMENT FOR IMPROVING CURL RETENTION, LUSTER, MANAGEABILITY, STRENGTH AND OTHER MECHANICAL PROPERTIES

James F. Kinney, Ramsey, N.J., and Anthoni Edward Gadzala, Suffern, N.Y., assignors to Avon Products Inc., Suffern, N.Y.

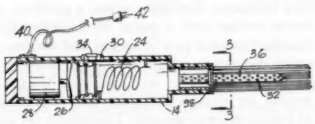
Filed Aug. 8, 1972, Ser. No. 278,769
Int. Cl. A45d *7/00*
U.S. Cl. 132—7 **8 Claims**

This invention relates to compositions and methods for improving the curl retention, luster, manageability and mechanical properties of human hair. More particularly, it has been unexpectedly found that hair dressing compositions containing a monomeric N-(oxoalkyl) acrylamide or its derivatives contained in a cosmetic carrier can be applied to the hair and the monomeric material polymerized safely thereon to provide the aesthetic and physical properties mentioned above.

3,820,551
HAIR DRYER AND GROOMER

Tony Lanzillotta, Toronto, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed June 20, 1973, Ser. No. 371,755
Int. Cl. A45d *24/00*
U.S. Cl. 132—11 **2 Claims**



A portable hair dryer which blows hot air through an outlet surrounded by individual flexible rods, the rods serving as means to curl or groom the hair while the hair is being dried by the blast of hot air. The device is compact and can be handheld, being powered by an extension line cord.

3,820,552
FILTER CARTRIDGE CLEANER

Robert S. Lang, and Robert L. Carnot, both of Tampa, Fla., assignors to L. F. Lang & Son Pools, Inc., Tampa, Fla.

Filed Feb. 22, 1973, Ser. No. 318,052
Int. Cl. B08b *3/02*
U.S. Cl. 134—113 **2 Claims**

A cartridge cleaner for cleaning filter cartridges which includes a shell having an inner wall defining a bore for receiving a filter cartridge, an annular space in the shell around the

inner wall, and an inlet for introducing water or other cleaning liquid into the annular space and then the bore for cleaning a

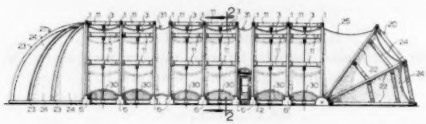
filter cartridge in the bore. The inner wall has apertures in it through which the cleaning liquid can pass from the annular space into the bore.

3,820,553

PAVILION WITH SERIES OF ARCHES AND METHOD OF ASSEMBLING AND ERECTING IT

Carl F. Huddle, Pleasant Ridge, Mich., assignor to Tension Structures Co., Royal Oak, Mich.

Filed Feb. 14, 1972, Ser. No. 225,899
Int. Cl. A45f *1/16*
U.S. Cl. 135—4 R **10 Claims**



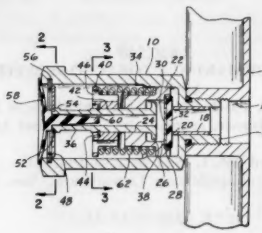
A tent-like structure, hereafter called a pavilion, with a series of curved arches and a panel of flexible membranous material attached to each pair of arches and tensioned in both directions with the panels concavely curved in the direction of the spacing of the arches as well as convexly curved in the other direction to minimize flutter and vibration and to enhance its load-carrying capacity. The panels are attached to the arches by inserting beads on their edges into tunnels in the arches so that the panels may slide lengthwise of the arches to tension them lengthwise. The arches are mounted on rails to swing from recumbent to upright positions and slide toward each other to facilitate assembly of the panels and away from each other to tension the panels transversely. To move the arches apart and tension the panels transversely, extensible struts, such as toggles or jack-screws, are provided between each pair of arches. Alternate arches may be made larger or smaller than the other arches to enable inside struts to be used without interference with the panels. End closures, of the same general construction as the body of the pavilion, which may close the ends of the pavilion or nest with the body of the pavilion to open the ends, may also be provided. The concave transverse curvature may be imparted to the panels in the manner disclosed in the applicant's application, S.N. 93293, filed Nov. 27, 1971, or by preforming the panels with such curvature.

3,820,554

FLUID PRESSURE RELIEF VALVE

Eugene E. Harnish, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Apr. 3, 1972, Ser. No. 240,740
Int. Cl. F16k *17/04*
U.S. Cl. 137—67 **9 Claims**



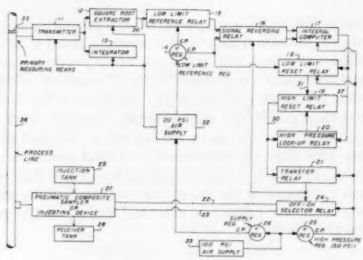
A fluid pressure release valve provided with a casing has an inlet and an outlet vented to high and low fluid pressure, respectively, wherein the inlet is sealed by a central portion of a spring loaded piston which spring bears against a stop member supported by a deformable support secured to the casing. The spring is overcome by a force derived from a predetermined high fluid pressure acting against the central portion exposed thereby venting high fluid pressure to the entire surface of the piston which moves into engagement with the stop member to load the same causing permanent deformation of the deformable support which, in turn, holds the piston away from sealing engagement with the inlet under bias of the spring to vent the inlet to the outlet and provides a visible indication of the released position of the valve.

3,820,555

FLOW PROPORTIONAL PNEUMATIC COMPOSITE SAMPLER

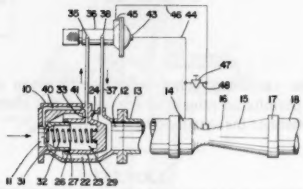
Alvin Q. Davis, Jr., 16106 LaCabana, Houston, Tex. 77058

Filed Apr. 23, 1973, Ser. No. 353,558
Int. Cl. G05d *11/035*
U.S. Cl. 137—100 **15 Claims**



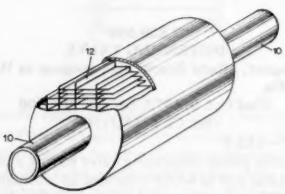
An illustrated embodiment of the present invention includes a fluid flow line sampling or injecting system for making injections into or taking samples from a fluid flow line at a sampling or injecting rate which is proportional to the total volume flow of fluid past a selected point in the flowline. An entirely automatic and fluid operated flow logic control system is provided which monitors the total fluid flow past a measuring point in a flowline, computes the occurrence of flow past the selected point of a predetermined quantity of fluid and operates a fluid sampling or injecting apparatus in response to the occurrence of the predetermined quantity of fluid.

3,820,556
FLUID FLOW CONTROL SYSTEM
James S. Millar, Fountain Valley, and Glenn W. Henderson, Tustin, both of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio
Filed May 11, 1973, Ser. No. 359,464
Int. Cl. G05d *7/03*
U.S. Cl. 137—220 **10 Claims**



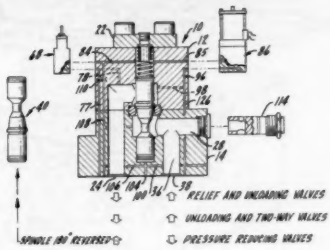
A system for controlling the rate of fluid flow through a main fluid pressure operated valve that is controlled by a pilot flow control valve. The pilot valve includes a movable wall responsive to pressure differential in the main system and also includes relatively movable seat and plug members that control flow of control fluid associated with the main valve, one of the members being activated by the movable wall to vary the relative positions of the members, and one of said members being movable by a manual means to vary the relative position of the members whereby the flow rate through the main valve at a given supply pressure may be varied. The invention also includes the arrangement of the pilot valve in which the manual means is mechanically and non-yieldingly connected to one of the valve elements of the pilot valve for positive movement thereof by the manual means.

3,820,557
PROPORTIONING SYSTEM
Lloyd H. Wartman, 110 Greens Farm Rd., Westport, Conn. 06880
Filed Aug. 4, 1972, Ser. No. 278,119
Int. Cl. A62c *15/16*
U.S. Cl. 137—268 **11 Claims**



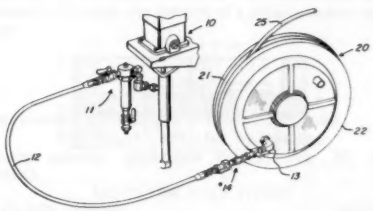
This invention is a system for injecting a substance into a flowing stream of fluid; specifically, it is a system for increasing the water-carrying capacity of fluid systems by introducing a drag-reducing polymer into the turbulent aqueous stream in the system.

3,820,558
COMBINATION VALVE
Erwin R. Mueller, Milwaukee, Wis., assignor to Rex Chainbelt Inc., Milwaukee, Wis.
Filed Jan. 11, 1973, Ser. No. 322,791
Int. Cl. F16k *1/44, 51/00*
U.S. Cl. 137—269 **15 Claims**



This is a combination valve primarily usable with high pressure water and other low viscosity fluids for both pressure and directional control applications and may be used as a relief valve, a pressure-reducing valve or an unloading valve.

3,820,559
HOSE REEL
Roger O. Griffiths, and Ronald E. Albrecht, both of Minneapolis, Minn., assignors to Graco Inc., Minneapolis, Minn.
Filed June 22, 1973, Ser. No. 372,888
Int. Cl. B65h *75/46*
U.S. Cl. 137—355.16 **7 Claims**

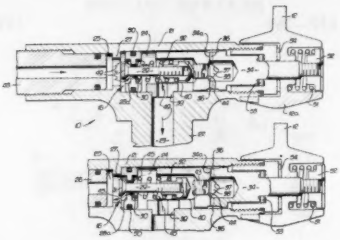


A hose reel is disclosed having a pair of plastic, flexible, dish-shaped hubs with mating circumferential surfaces spaced apart less than the diameter of the hose, and having an enclosed inner chamber for storing a length of such hose, and a hose connector protruding through the side of one of the hubs at an inner diameter and connectable to the interior hose end.

3,820,560
RESERVE VALVE MECHANISM PERMITTING REFILLING OF SCUBA TANK REGARDLESS OF VALVE SETTING
Karl Leemann, Wehntalersh 142 8057, Zurich, Switzerland
Filed Jan. 29, 1973, Ser. No. 327,719
Int. Cl. F16k *45/00, 17/00*
U.S. Cl. 137—493.4 **8 Claims**

A reserve mechanism for use with a self-contained breathing apparatus includes a valve which permits the breathing gas supply tank to be refilled regardless of the valve setting. The valve includes two cooperating members, an annular valve seat member and a piston member, which are spring biased toward a flow impeding position. Each member is movable in a direction opposite the other, so that the valve

opens when the gas pressure in either direction exceeds the spring bias force. This permits gas from a compressor or other



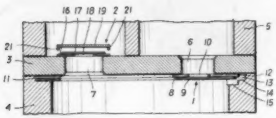
source to flow in the reverse direction through the valve and refill the tank even though the valve is not set to the manually opened, "reserve" position.

3,820,561

NON-RETURN VALVE ASSEMBLY

Josef Papst, deceased, late of Vienna, Austria; Stephanie Papst, Ghelengasse 42/9, Vienna, Austria, and Brigitte Brockmuller, (heirs) 26 Tarragon Dr., Kirkland, Montreal, Canada

Filed May 23, 1973, Ser. No. 363,135
Int. Cl. F16k *15/16*
U.S. Cl. 137—512.2 2 Claims



A valve assembly particularly for use in piston compressors wherein a valve opening is covered by a pair of superposed plate-like closure members. The closure member closer to the valve seat has an aperture and the closure members have stroke limiting stops at different distances from the valve seat so that when the member closer to the seat has reached its maximum opening, the other member can still open further to uncover said aperture.

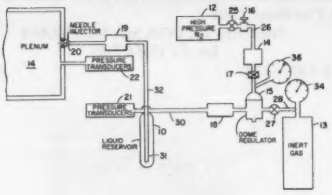
3,820,562

CONTINUOUS LIQUID CHEMICAL INJECTOR

Thomas G. Roberts; Charles M. Rust; Billie O. Rogers; Henry L. Pratt, III, all of Huntsville, Ala., and Robert L. Morgan, Fayetteville, Tenn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 22, 1973, Ser. No. 325,499
Int. Cl. H01s *3/00*
U.S. Cl. 137—209 2 Claims

A continuous liquid chemical injector utilizing a back pressure of inert gas to control the amount of mass flow rate of a liquid chemical into the volume of interest such as the plenum of a gas dynamic laser or a combustion initiated chemical laser. The mass flow rates are continuous and can be varied



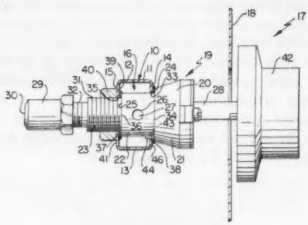
with the variations being programmed when desired. The device permits no release or leakage of the chemicals to the atmosphere or the surroundings.

3,820,563

FUEL SUPPLY MANIFOLD HAVING ORIENTING MEANS FOR MOUNTING A CONTROL DEVICE THERETO

Roy C. Demi, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 145,272, May 20, 1971, Pat. No. 3,746,039. This application May 2, 1973, Ser. No. 356,498
Int. Cl. F16k *51/00*
U.S. Cl. 137—561 R 1 Claim



A manifold defined by an annular wall providing a fuel supply passage in the manifold and having a pair of openings passing therethrough on each side of the manifold. A control device is disposed in the openings so as to have one part thereof on one side of the manifold and another part thereof projecting out of the opposite side of the manifold with an intermediate part of the control device disposed inside the manifold, the control device having means for conveying fuel adjacent the intermediate part thereof out through the projecting part thereof and being secured to the manifold in a stacked and sealed relation therewith.

3,820,564

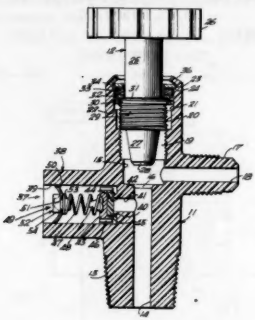
DISPENSING VALVE

William Wagner, Miami Beach, Fla., assignor to Watsco Inc., Hialeah, Fla.

Filed Oct. 9, 1973, Ser. No. 404,500
Int. Cl. F16k *31/44*
U.S. Cl. 137—612.1 10 Claims

A disposable plastic dispensing valve having a plastic valve body within one end of which is formed an internally threaded bore adjustably screw-threaded within which is the externally threaded shank portion of a valve stem assembly for axial movement thereof between seated and withdrawn positions with respect to a valve seat. The valve body further comprises an increased-diameter cylindrical chamber outwardly of its internally threaded bore within which the threaded shank portion of the valve stem assembly can freely turn when the valve is opened beyond full open position of the valve to prevent

forceful turning withdrawal of the valve stem assembly through the upper end of the valve body. Means is provided for resiliently urging the valve stem into inter-threaded engagement with respect to the internally threaded bore of the valve body member to facilitate subsequent shut-off of the valve.



3,820,565

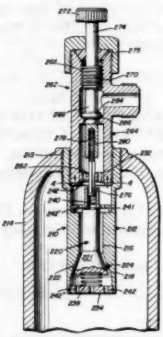
AUTOMATIC SAFETY CUTOFF VALVE

Arland J. Durbin, 9975 Rosemere St., Elyria, Ohio 44035

Filed July 26, 1972, Ser. No. 275,263

Int. Cl. F16k *17/168*

U.S. Cl. 137—614.2 **8 Claims**



An automatic safety cutoff valve having a housing arrangeable in a fluid flow path and a valve element movably arranged in a passageway of the housing. Spring elements are arranged on upstream and downstream sides of the valve element for biasing them toward a stable valve open position when pressures on the upstream and downstream sides of the valve element are substantially equal. This position becomes unstable when the downstream pressure is substantially less than the upstream pressure, causing the valve element to move to a valve closed position blocking flow in the flow path. The cutoff valve may be used in conjunction with a selectively actuatable on-off valve to provide a dual-purpose system.

3,820,566

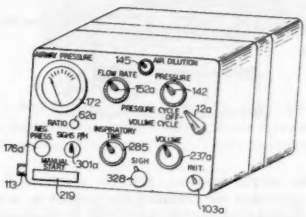
VENTILATOR

Leif J. Sundblom, Castro Valley, and Louis A. Ollivier, Menlo Park, both of Calif., assignors to Veriflo Corporation, Richmond, Calif.

Continuation of Ser. No. 178,327, Sept. 7, 1971, abandoned, which is a division of Ser. No. 867,804, Oct. 20, 1969, Pat. No. 3,669,108. This application May 14, 1973, Ser. No. 359,698

Int. Cl. G05b *11/44;* **A62b** *7/02*

U.S. Cl. 137—624.14 **2 Claims**



A ventilator capable of both pressure-cycled and volume-cycled operation. A main valve connects a gas supply conduit to a downstream conduit when the pressure in a command signal conduit reaches a first predetermined pressure level and closes off the downstream conduit from the gas supply conduit when the pressure in the command signal conduit drops below a second predetermined pressure level. In the expiratory cycle, the command signal conduit and the downstream conduit are bled to atmospheric. The inspiratory cycle may be initiated (1) by the patient breathing in and thereby lowering airway pressure, or (2) after a time lapse following the commencement of said expiratory phase, the duration of said time lapse being determined as a set multiple of the time of the preceding inspiratory phase. The expiratory phase may be initiated (1) by the achievement of a predetermined airway pressure or (2) upon the delivery of a predetermined volume of gas.

3,820,567

PNEUMATIC MEMORY RELAY

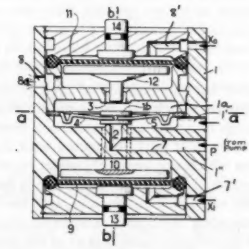
Daniel Bouteille, 3 Rue Lanen, 9219 Meudon, France

Filed Aug. 17, 1972, Ser. No. 281,545

Claims priority, application France, Aug. 27, 1971, 71.32043

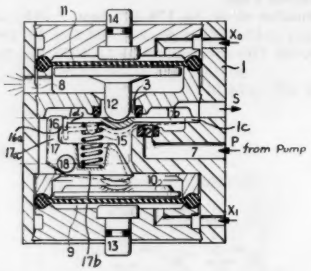
Int. Cl. F16k *11/10, 31/385*

U.S. Cl. 137—625.66 **30 Claims**



A memory relay has a poppet movable between two positions in a space of a relay housing. The poppet surfaces are arranged to sealingly engage a seat in each position, each seat bounding an input conduit arranged to receive a fluid under pressure. An output conduit is in communication with the

space and the exterior of the housing. Means are provided for moving the poppet from one position to the other in response to the application of a set or reset signal to the relay whereby the pressure in one or the other input conduit is caused to ap-



pear at the output conduit. Bistable mechanical biassing means are provided for retaining the poppet in at least one position independently of the presence or absence of pressures in the input conduits.

3,820,568

SLIDE VALVE FOR HYDRAULIC PRESSURE SYSTEMS

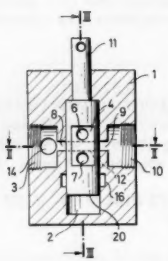
Rudolf Brunner, Baldham, and Siegfried Zenker, Poing, both of Germany, assignors to Heilmeier & Weinlein Fabrik fur Oil-Hydraulik KG, Munich, Germany

Filed Oct. 20, 1972, Ser. No. 299,300

Claims priority, application Germany, Oct. 22, 1971, 2152830

Int. Cl. F16k *11/07*

U.S. Cl. 137—625.68 **9 Claims**



A slide valve for the control of high pressure hydraulic systems is provided which can be manufactured in a compact form for savings of space and production costs by virtue of having a pressure inlet port connected with first and second inlet apertures which are angularly offset in substantially the same cross-sectional plane of a valve housing having a longitudinally slidable valve member therein, with the first inlet aperture communicating through a transverse duct in the valve member with an exhaust (outlet) port of the housing when the valve member is in a neutral position, and the valve member having communication ducts formed therealong, advantageously as flat regions at opposite sides thereof interconnected by bores extending transversely therethrough at right angles to the aforesaid transverse duct, by which the second inlet aperture is connected with at least one pressure output or service port in the housing when the valve member is in a service position.

3,820,569

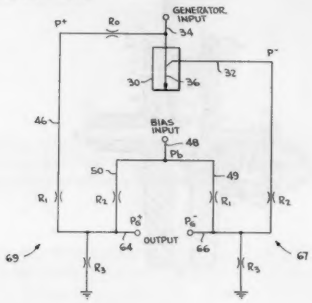
FLUIDIC CONSTANT BIAS DIFFERENTIAL SIGNAL GENERATOR

Robert L. Woods, Kensington, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 7, 1973, Ser. No. 338,786

Int. Cl. F15c *1/00*

U.S. Cl. 137—816 **9 Claims**



A constant-bias differential fluidic signal generator. A zero-bias differential fluidic signal is summed with a constant but adjustable bias signal. The zero-bias differential signal is generated by two signals that increase and decrease proportionately and simultaneously as a function of a control pressure. Such signals can be generated with a fluidic aspirator that creates a vacuum signal in proportion to an applied pressure signal. If the transfer characteristic of such an aspirator is linear with unity gain, the bias of the differential signal generated thereby would be zero. The two signals generated by the aspirator are combined with a constant-bias signal through a pair of passive summing junctions. This provides not only a constant bias level but one which is independently adjustable by means of the constant-bias signal level, thereby rendering the device very valuable in the testing of fluidic components and systems.

3,820,570

SUCTION BEND CONDUIT FOR USE WITH CENTRIFUGAL PUMPS

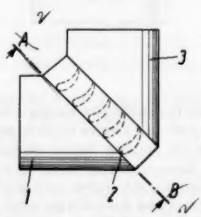
Erich Holzhuter, Lutzelsachsen/Weinheim, Germany, assignor to Klein, Schanzlin, Becker Aktiengesellschaft, Frankenthal (Pfalz), Germany

Filed July 13, 1972, Ser. No. 272,911

Claims priority, application Germany, July 14, 1971, 2135097

Int. Cl. F15d *1/04*

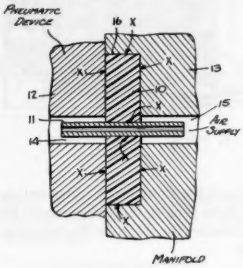
U.S. Cl. 138—39 **2 Claims**



A tubular curved conduit body is provided with an inlet and an outlet, the latter to be connected with the intake of a centrifugal pump. One or more guide vanes extend across the passage of the conduit intermediate the inlet and outlet and

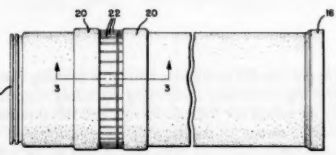
are each composed of two sections fast with the conduit body at diametrally opposite locations and having inner ends which extend toward but are spaced from one another.

3,820,571
FLUID RESTRICTION ASSEMBLY
David G. Grier, Elkins Park, Pa., assignor to Fischer & Porter Co., Warminster, Pa.
Filed Nov. 11, 1971, Ser. No. 197,843
Int. Cl. F15d 1/02
U.S. Cl. 138—44 **4 Claims**



A restriction assembly adapted to be installed at the junction of a pneumatic device having an inlet-passage terminating at a wall, and a manifold or other coupling element attachable to the wall and having a fluid-supply passage in registration with the inlet passage, the restriction introducing fluidic resistance between the two passages. The fluid supply passage is enlarged at the junction to create a socket. The restriction is constituted by an elastomeric disc which is press fit into said socket, and a capillary tube pierced through the disc, the tube providing a restricted flow conduit interconnecting the two passages.

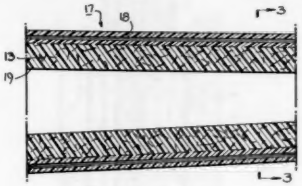
3,820,572
PIPE STRUCTURE
Lewis R. Keyser, Dayton, Ohio, assignor to Price Brothers Company, Dayton, Ohio
Filed Jan. 20, 1972, Ser. No. 219,301
Int. Cl. F16l 3/00
U.S. Cl. 138—106 **18 Claims**



An underground pipe structure which includes an anchor for resisting longitudinal movement of the pipe line in response, principally, to thrust forces generated by hydrostatic pressure at elbows, reducers, valves and bulkheads.

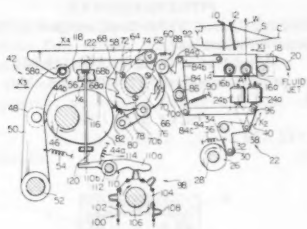
3,820,573
TUBULAR LAMINATE AND A METHOD OF MAKING A TUBULAR LAMINATE
Raymond Francis Carmody, Nassau Bay, Tex., assignor to Shakespeare Company, Columbia, S.C.
Filed June 22, 1971, Ser. No. 155,522
Int. Cl. F16l 9/14
U.S. Cl. 138—141 **7 Claims**

The tubular member is made by forming a layer of chopped glass fibers over the mandrel and thereafter positioning an equal number of filaments in parallel longitudinally over the layer of chopped fibers. After curing, the mandrel can be removed or retained within the laminate. The tubular member



thus has a shell formed of longitudinal filaments which extend along the length of the laminate over a core layer of chopped fibers and an overall thickness which varies as desired.

3,820,574
WEFT SELECTOR MECHANISM OF A FLUID JET LOOM
Yukio Mizuno, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Kanagawa-ku, Japan
Filed Oct. 13, 1972, Ser. No. 297,334
Claims priority, application Japan, Oct. 13, 1971, 46-80779
Int. Cl. D03d 47/34
U.S. Cl. 139—127 P **3 Claims**

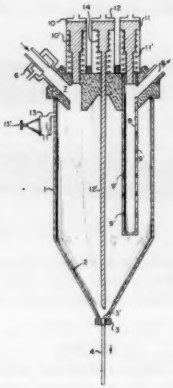


Herein disclosed is a novel weft selector mechanism in which wefts are inserted into a shed of warps by the aid of a stream of fluid spurting selectively from two or more fluid jet nozzles, the mechanism being adapted to prepare a cloth with any desired variegated weft pattern and comprising means operative to actuate the fluid jet nozzle in alternate cycles and means to vary the weft feeding cycles in accordance with signals which are carried on a pattern card arrangement to be representative of a desired weft pattern. The mechanism may further includes means adapted to measure and store the wefts to be supplied to the fluid jet nozzles, such means being actuated on the signals on the pattern card arrangement.

3,820,575
MACHINE TO STUFF TOYS
Rene Kevran bachian, Plaisance Bloc A 3-, Marseille geme, France
Filed June 22, 1972, Ser. No. 265,312
Claims priority, application France, June 25, 1971, 71.25373
Int. Cl. B65b 1/04
U.S. Cl. 141—18 **5 Claims**

A pneumatic device secured to an upright support comprising a distribution reservoir communicating with an external supply of stuffing material and air under pressure, a prolonged tubular element operably attached to a conical distribution

valve, said tubular element adapted to inject stuffing into toys. The device is primarily operated by two foot levers operably

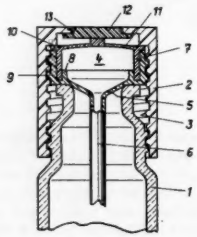


engaging a first, second, and third spring loaded control valve jack which controls the flow of stuffing and air to and from the distribution reservoir.

3,820,576
PIPETTE STOPPER

Roger Torrent, Geneva, Switzerland, assignor to Firmenich & Cie, Geneva, Switzerland

Filed May 1, 1972, Ser. No. 249,141
Claims priority, application Switzerland, May 14, 1971, 7135/71
Int. Cl. B65d *1/08*
U.S. Cl. 141—24 **1 Claim**



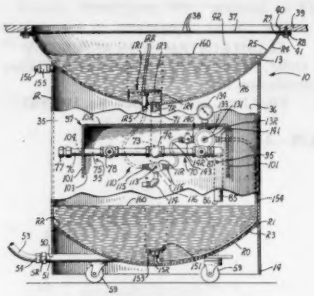
A screw-on bottle stopper has a pipette connected to a flexible chamber which can be squeezed through an opening in the stopper to suck up and expel the contents of the bottle. The chamber comprises two parts, a flexible part and a rigid one, tightness being ensured by the perfect nesting of the parts.

3,820,577
VISCOUS FLUID HANDLING DEVICE

Ray F. Sidebottom, 5841 Olive Dr., Bakersfield, Calif. 93308

Filed Jan. 31, 1972, Ser. No. 221,981
Int. Cl. B65b *3/14*
U.S. Cl. 141—67 **3 Claims**

A viscous fluid handling device having a frame; a pressure tank having upper and lower ends defining an interior mounted in the frame; a source of compressed air communicating with the interior of the tank; a conduit, having a remote end, mounted at the lower end of the tank in communication with the interior; a selectively operable release valve mounted at the remote end of the conduit; and a metering valve mounted in operable association with the source of com-

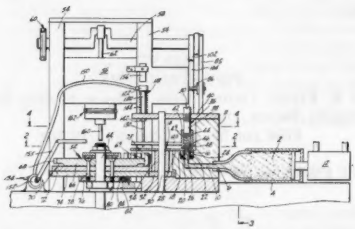


pressed air operable to maintain a desired air pressure within the interior of the tank to motivate viscous fluid from the tank through the conduit for selective discharge by operation of the release valve.

3,820,578
METHOD AND APPARATUS FOR THE AUTOMATIC CHARGING OF PRIMER CONTAINERS

Edward A. Staba, Higganum, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed May 15, 1972, Ser. No. 253,481
Int. Cl. B65b *43/50*
U.S. Cl. 141—190 **7 Claims**



An apparatus for charging extrudable priming compositions into priming containers comprising extruding means, rotatable conveying means for the containers, and intermediate rotatable transfer means for transferring a predetermined volume of the composition from the extruding means to the container to be charged.

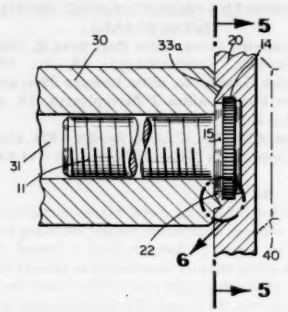
3,820,579
BLIND STUD FASTENER

John K. Barry, Springfield, Pa., assignor to Southco, Inc., Lester, Pa.

Continuation of Ser. No. 128,695, March 29, 1971, abandoned. This application July 13, 1972, Ser. No. 271,385
Int. Cl. B23p *11/00*; **F16b** *9/00, 39/00*
U.S. Cl. 151—41.73 **1 Claim**

A blind stud fastener has an enlarged head and a shank which is usually threaded. The enlarged head has a knurled perimeter or other configuration designed to prevent rotary motion of the stud in the panel. The stud is installed in a sheet metal panel, or panel of plastic or other material, without passing through the panel, by means of a special punch the

face of which is designed to first push and embed the head of the stud to a proper depth in a counterbored hole in the panel and thereafter by means of a forwardly-projecting peaked annulus or other closed configuration to cause material of the panel to flow across the edge and over the surface of the head which is nearer to the shank.



3,820,580

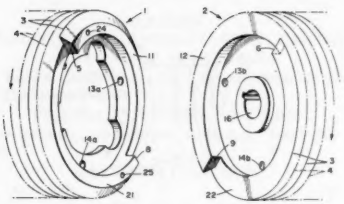
SIPING DRUM AND APPARATUS FOR FORMING SIPING SLASHES

Forrest Clayton Meserve, North Andover, Mass., and Ralph Christian Raabe, Jr., Letts, Iowa, assignors to Bandag Incorporated, Muscatine, Iowa

Filed July 14, 1972, Ser. No. 271,657

Int. Cl. B29h *21/08*

U.S. Cl. 157—13 **10 Claims**



A drum is provided having at least two helical parallel threads and at least two knives attached thereto having cutting edges extending above the surface. Each knife is located on a different helical thread from the other knive. The drum is used to sipe predetermined lengths of tread stock or a tire.

3,820,581

MULTIPLE EFFECT EVAPORATOR APPARATUS

Shunichi Machida; Masaharu Tsujita; Shintaro Nakaya, and Ryoji Ueno, all of Tokyo, Japan, assignors to Ebara Manufacturing Co., Ltd., Tokyo, Japan

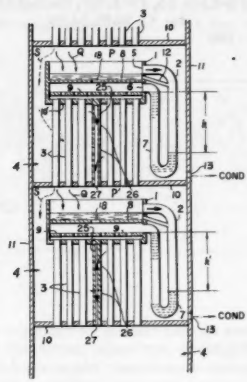
Filed Feb. 16, 1973, Ser. No. 333,035

Claims priority, application Japan, Feb. 16, 1972, 47-16122

Int. Cl. B01d *1/26, 3/02, 1/22, 3/08*

U.S. Cl. 159—13 A **5 Claims**

A multiple effect evaporator apparatus features a plurality of vertically arranged evaporator chambers, each having a plurality of vertically oriented heat exchange tubes molded at their lower ends to a bottom plate of the chamber and supporting a vessel at their upper ends, said vessel being adapted to receive a solution from an upper chamber, an overflow tube of substantially U-shaped configuration connected at one end to an upper part of the vessel and at the other end being open to the pressure of the next lower chamber, and means for maintaining a pressure difference between the respective chambers.



3,820,582

DEVICE FOR EVAPORATION OF LIQUIDS

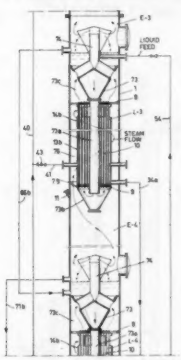
Arvi Ronnholm, Pori, Finland, assignor to Oy W. Rosenlew AB Metallindustrin, Pori, Finland

Filed Dec. 2, 1971, Ser. No. 204,079

Claims priority, application Switzerland, Dec. 14, 1970, 16912/70

Int. Cl. B01d *1/26*

U.S. Cl. 159—18 **14 Claims**

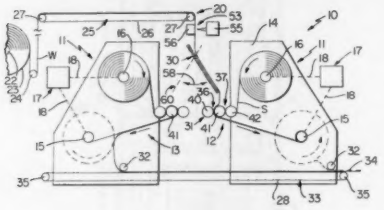


A device for evaporation of liquids comprising evaporation units coupled in series. The evaporator units include a tube heat exchanger and a separating device coupled thereto. The heat exchangers are arranged aligned above each other whereby each heat exchanger forms a preseparator for the liquid to be evaporated in that heat exchanger and a subsequent separator for the steam evaporated in the preceding heat exchanger.

3,820,583
APPARATUS FOR AND METHOD OF MAKING A MULTIPLE LAYER SHEET

James I. Sparks, and Paul L. Spivy, both of Springfield, Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Jan. 18, 1973, Ser. No. 324,693
Int. Cl. B65h 54/00
U.S. Cl. 156—190 11 Claims

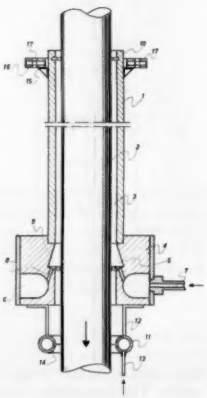


An apparatus for and method of making a multiple layer sheet in a substantially continuous manner are provided each of which employs a permanent reusable substrate which is movable in opposed directions and which enables a supply web of material used to define such sheet to be laminated to define any desired number of layers by urging a first length of the web into adhering contact against the substrate while moving the substrate in one direction followed by bi-folding the web to start a second length and urging the second length of the web into adhering contact against the first length to define the multiple layer sheet while moving the substrate in a direction opposite from the one direction.

3,820,584
METHOD FOR THE COOLING OF A CONTINUOUSLY CAST PRODUCT

Robert Alberny, and Alain Leclercq, both of Metz, France, assignors to Institut de Recherches de la Sederurgie Francaise, Saint-Germain-en-Laye, France

Filed Jan. 17, 1973, Ser. No. 324,367
Claims priority, application France, Jan. 21, 1972, 72.1987
Int. Cl. B22d 11/12
U.S. Cl. 164—89 3 Claims



A method and apparatus for cooling a product emerging from a mold, in which a coolant is directed upwardly through a casing surrounding the product as the product moves downwardly through the casing from the mold. The casing has an internal cross section similar in shape to but larger than the cross section of the product.

3,820,585
METHOD FOR THE PRODUCTION OF MULTILAYER METAL BLANKS

Grigory Antonovich Piven, ulitsa Pugacheva 2; Nikifor Karpovich Khodich, Komomolskaya, 45, kv. 19; Alexei Lavrentievich Gapshenko, ulitsa Letnaya 39-a, and Nikolai Nikolaevich Fursov, ulitsa 3 Zhivopisnaya, 19, all of Zhdanov, U.S.S.R.

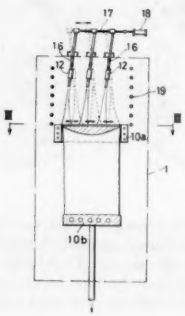
Continuation of Ser. No. 132,601, April 8, 1971, abandoned.
This application Dec. 4, 1972, Ser. No. 311,646
Int. Cl. B22d 19/00
U.S. Cl. 164—94 2 Claims

A method for producing metal blanks comprising several layers of the same or of different metals; including the steps of pouring liquid metal in batches into a mould previously charged with a slag mixture functioning to protect the surface of the metal; each subsequent pour of metal after the first one, being delivered into the mould after the horizontal surface of a preceding pour has become coated with a support crust of a solid metal; the temperature of the support crust formed being higher than the melting point of the protective slag mixture, but lower in temperature than the crystallization temperature of the metal poured.

3,820,586
APPARATUS FOR SWEEPING THE BEAM FROM A PLASMA ELECTRON GUN ON THE SURFACE OF A MOLD OF A CONTINUOUS INGOT CASTING DEVICE

Hiromichi Takei, Chigasaki, Japan, assignor to Nihon Shinku Gijutsu Kabushiki Kaisha., CULVAC Corporation in England, Ken, Japan

Filed Nov. 8, 1972, Ser. No. 304,800
Claims priority, application Japan, Nov. 8, 1971, 46-88263
Int. Cl. B22d 11/10, 27/02
U.S. Cl. 164—250 1 Claim

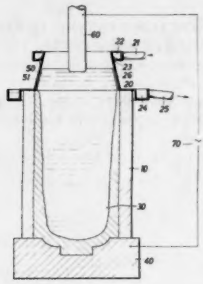


Apparatus for continuous manufacture of a slab ingot in which in a vacuum chamber raw material for an ingot is melted and continuously charged into a water-cooled mold having a stationary rectangular side frame and a movable bottom plate, while the upper surface of the charged material is heated by a plasma electron gun located above the mold. The bottom plate of the mold is gradually lowered whereby there is obtained on the bottom plate a gradually solidified rectangular pillar-shaped ingot. The plasma electron gun is oscillated by a power source, such as a hydraulic cylinder so that the beam from the electron gun is reciprocated over the upper surface of the material in the mold whereby the temperature at the upper surface of the material can be made substantially uniform.

3,820,587
APPARATUS FOR MAKING METAL INGOTS

Erwin Plockinger, and Gert Kuhnelt, both of Kapfenberg, Austria, assignors to Gehr, Bohler & Co., Kapfenberg, Austria

Filed Aug. 6, 1969, Ser. No. 847,891
Claims priority, application Austria, Aug. 7, 1969, 530/69
Int. Cl. B22d 27/02
U.S. Cl. 164—252 14 Claims

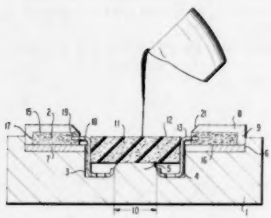


A body of molten metal is provided in a lower portion of an ingot mold. A body of liquid slag is provided in said mold on top of said body of molten metal within a slag-confining wall. Heat energy is supplied to said body of liquid slag at a rate corresponding to at least 120 kilowatt-hours per metric ton of metal in said mold. The slag-confining wall is supplied on the outside thereof with a cooling fluid to cool said slag-confining wall sufficiently to maintain a layer of solid slag between said wall and said body of liquid slag. The molten metal in said mold is caused to solidify while those parts of said mold which are contacted by said metal are kept out of contact with cooling liquid.

3,820,588
APPARATUS FOR MANUFACTURING COMPOSITE CASTING OF BRAKE-DISKS

Gunter Funke, Deufringen, Germany, assignor to Daimler-Benz Aktiengesellschaft

Filed Mar. 29, 1972, Ser. No. 239,042
Claims priority, application Germany, Mar. 30, 1971, 2115299
Int. Cl. B22d 13/04, 19/00
U.S. Cl. 164—288 20 Claims

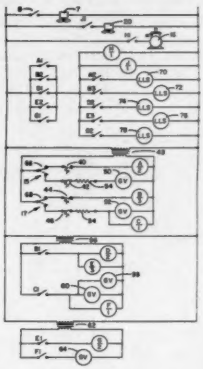


A method and apparatus for the manufacture of compound cast brake disks having a cast friction ring forming the brake disk, properly speaking, in which a steel hub provided with a centering aperture is centered on a rotatable centrifuging table by means of a centering pin or the like whereby the flange-like radially outwardly extending edge of the hub projects into the mold for the cast friction ring which during the rotation of the centrifuging table is filled with the melt from the outside toward the inside.

3,820,589
MODULAR MULTIZONE ZONE LOGIC CONTROL CENTER

George C. Callahan, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 131,153, April 5, 1971, Pat. No. 3,709,769. This application Nov. 15, 1972, Ser. No. 306,966
Int. Cl. F25b 29/00
U.S. Cl. 165—2 1 Claim

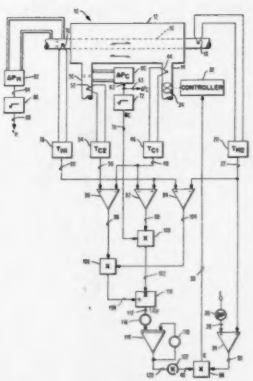


A control system for utilizing a single, low voltage thermostat to actuate a plurality of heating means or a plurality of cooling means.

3,820,590
ON-LINE ADAPTIVE CONTROL OF A HEAT EXCHANGER

Bernard Littman, 7813 William Ave., Philadelphia, Pa. 19150, and Paul Garson Friedmann, 701 Linden Rd., Wyndmoor, Pa. 19118

Filed Feb. 28, 1973, Ser. No. 336,670
Int. Cl. F25b 29/00
U.S. Cl. 165—26 7 Claims



A temperature controlling system applied to a counter-flow heat exchanger is made adaptive by modifying the proportional gain of the controlling system so as to maintain the loop gain constant as the temperature of the cooling water changes. When the hot side flow is constant and the heat transfer requirement is constant the proportional gain is adjusted in ac-

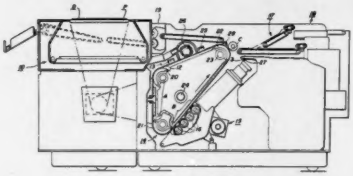
cordance with the product of the cold side flow squared times the difference between the inlet temperatures of the hot and cold side. Otherwise, the expression must include the heat transfer variation and the variation in hot side flow.

3,820,591

APPARATUS FOR SENSING A DIMENSION OF SHEETS OF MATERIAL TO BE TRANSPORTED THROUGH AN ELECTROSTATIC REPRODUCTION MACHINE

Jeffrey L. Sisson, Rochester, and Paul D. Norder, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 30, 1971, Ser. No. 214,345
Int. Cl. B60h *1/00*
U.S. Cl. 165—39 **5 Claims**



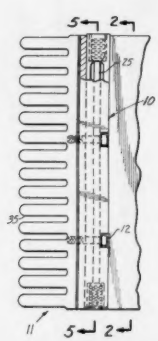
Apparatus for regulating the removal of heat from a fusing assembly in accordance with a dimension of the sheets of material transported thereto is disclosed in accordance with the teachings of the present invention. Heat transfer means is energized by switch means, the latter being adapted to be contacted by activating means. The switch means and activating means are disposed for relative movement therebetween such that a contacting relationship is established when the dimension of the sheets of material included in a supply therefor exceeds a predetermined dimension. Movement between the switch means and activating means is effected by the adjustment of sheet guide means, said adjustment enabling said sheet guide means to receive sheets of material.

3,820,592

THERMALLY CONDUCTIVE MOUNTING MEANS

Jack Robert Lander, Walnut, Calif., assignor to Electro-Module, Inc., Pomona, Calif.

Filed July 18, 1973, Ser. No. 380,341
Int. Cl. F24h *3/00*
U.S. Cl. 165—47 **12 Claims**



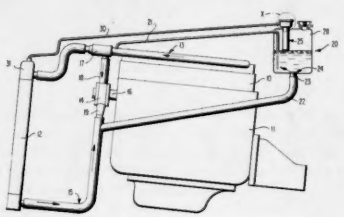
There is disclosed a wedge set comprising a wedge block containing a slot with a movable wedge slidable within the slot leaving a space between the movable wedge and the juxtaposed wall of the wedge block. A screw shaft is threaded to the wedge block and to the movable wedge so that rotation of the screw slides the wedge relative to the block causing the said space to enlarge or decrease. A module plate or the like fitted in the space can thus be clamped by tightening the screw. The clamping is with very great pressure so that when the module plate becomes heated the heat is readily and efficiently conducted to and through the wedge block from where it can be dissipated in a heat sink, or transferred into a heat exchanger for disposition by other means such as waste water and the like.

3,820,593

INSTALLATION FOR VENTING THE COOLING LIQUID OF AN INTERNAL COMBUSTION ENGINE

Rolf Pabst, Neuhausen, Germany, assignor to Daimler-Benz Aktiengesellschaft

Filed Nov. 30, 1971, Ser. No. 203,372
Claims priority, application Germany, Dec. 1, 1970, 2058995
Int. Cl. F01p *11/02, 11/18*; F28d *15/00*
U.S. Cl. 165—51 **12 Claims**



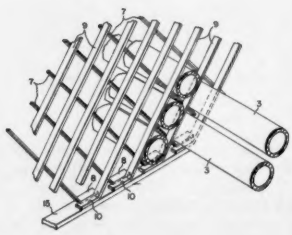
An installation for venting the cooling liquid of an internal combustion engine by means of an expansion tank, in which the expansion tank is interconnected into an auxiliary circulation of the cooling liquid and the auxiliary circulation is connected in parallel to the main circulation, and in which at least one geodetic high-point of the main circulation is connected to its own universal vent line and the universal vent line terminates in the interior space of the expansion tank; the expansion tank is thereby adapted to be selectively connected with the atmosphere or closed off with respect thereto while a one way check-valve precluding the flow from the expansion tank to the geodetic high-point is connected in effect between the high-point of the universal vent line and the interior space of the expansion tank.

3,820,594

TUBE SUPPORT SYSTEM FOR HEAT EXCHANGER

Paul D. Ritland, Secane, and Rollin W. Ache, New Town Square, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 15, 1972, Ser. No. 315,708
Int. Cl. F28f *1/00*
U.S. Cl. 165—69 **4 Claims**



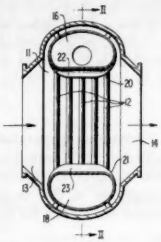
Two groups of parallel flat bars disposed on an angle with respect to each other form a lattice which engages four sides

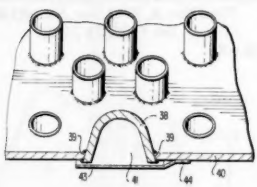
of each tube to reduce the vibrations; the ends of the flat bars are bent and fastened to end bars which provide rigidity necessary to produce an economical vibration dampening support system which can be easily installed in an assembled heat exchanger.

3,820,595
HEAT-EXCHANGER

Eggert Tank, Fellbach, and Eberhard Tiefenbacher, Ludwigsburg, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed July 28, 1972, Ser. No. 276,173
Claims priority, application Germany, July 30, 1971, 2138109
Int. Cl. F28f *7/00*
U.S. Cl. 165—83 **25 Claims**





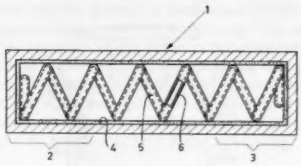
A heat-exchanger, especially for vehicle gas turbines which comprises tubes arranged between chambers, through which flows a first medium, and a housing surrounding the tubes, through which flows a second medum; the thermally strongly stressed wall portions of the chambers are provided with expansion folds within the area of the terminations of the tubes in the chambers.

3,820,596
HEAT TRANSPORTING DEVICE

Erolf Weinhardt, and Cornelis Leendert De Wit, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 17, 1972, Ser. No. 218,174
Claims priority, application Netherlands, Jan. 27, 1971, 7101035
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 **2 Claims**

In a heat pipe device having a porous mass through which heat transporting medium condensate can flow from the condenser to the evaporator by capillary action, this porous mass is kept in its place relative to the container by at least one resilient and hollow element. The cavity within the resilient element forms a closed space in which a filling medium is present, the pressure of which, at least at the operating temperature of the device, is higher than the pressure in the container, whereby the resilient element

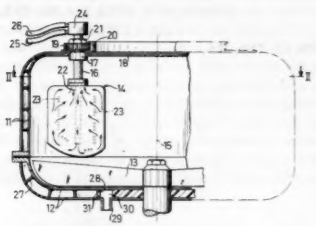


exerts a force on the porous mass due to both said resiliance and the influence of the pressure differential across these members.

3,820,597
MIXER HAVING A DEVICE FOR COOLING OF MATERIAL TO BE MIXED

Wolfgang Bittner, Dusseldorf; Karl-August Berker, and Gunter Claes, both of Detmold, all of Germany, assignors to Gunther Papenmier KG Maschinen-und Apparatebau, Detmold, Germany

Filed Sept. 6, 1972, Ser. No. 286,542
Claims priority, application Germany, Sept. 15, 1971, 2146150
Int. Cl. F28f *13/12*
U.S. Cl. 165—109 **19 Claims**



A mixer having a device for the cooling of powdered, granular, liquid or otherwise flowable material to be mixed, in particular plastics agglomerates or the like, consisting of a cup-shaped mixture container which may be double-walled and through which a coolant flows, and which has a mixing implement rotating in its center over the bottom thereof.

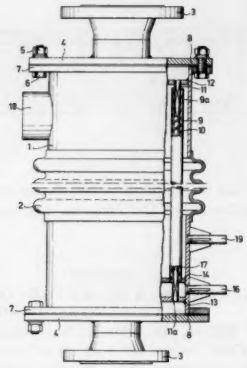
3,820,598
APPARATUS FOR COOLING LIQUIDS

Horst Fenger, Hosel, and Ferdinand Pfeifer, Krefeld, both of Germany, assignors to Messer Griesheim GmbH, Frankfurt, Germany

Filed Nov. 27, 1972, Ser. No. 309,807
Claims priority, application Germany, Nov. 26, 1971, 2158716
Int. Cl. F28d *7/00*
U.S. Cl. 165—160 **3 Claims**

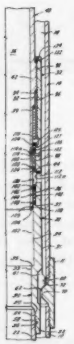
Apparatus for cooling liquids, particularly fuels, comprises steps of passing liquid to be cooled along plurality of separate paths interconnected at starting and end points of paths. Cooling medium is countercurrently passed along a plurality of paths equal to number of liquid paths with each path of cooling medium associated with one of liquid paths. Cooling medium paths are interconnected at starting and end points.

Device for cooling liquids comprises heat exchanger having housing and plurality of pipe assemblies therein. Each pipe assembly includes inner pipe for carrying liquid being processed



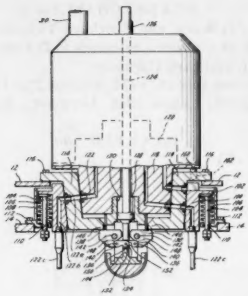
and outer pipe for carrying cooling medium. Chambers in housing interconnect all of inner pipes and separately interconnect all of outer pipes.

3,820,599
CIRCULATION APPARATUS
John Walton McCaskill, III, Houston, Tex., assignor to Rockwell Manufacturing Company, Houston, Tex.
Filed Sept. 1, 1972, Ser. No. 285,746
Int. Cl. E21b *33/00*
U.S. Cl. 166—.5 **22 Claims**



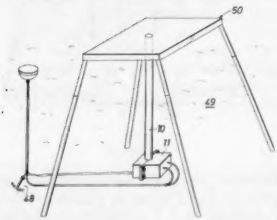
The circulation apparatus is a coupling mounted between a riser extending to the drilling rig and a casing string suspended within the well. The apparatus controls the passage of fluids from the flow bore of the riser to the annulus around the riser. The apparatus includes an outer sleeve having circulation ports and an inner sleeve movable axially by rotation of the riser. The inner sleeve controls the passage of fluids through the circulation ports by means of its position relative to the outer sleeve. A pack off containing a compression element is provided as a final seal after the circulation operation is completed.

3,820,600
UNDERWATER WELLHEAD CONNECTOR
Hollis A. Baugh, Houston, Tex., assignor to C. Jim Stewart & Stevenson, Inc., Houston, Tex.
Filed June 26, 1972, Ser. No. 266,283
Int. Cl. E21b *7/12*; E21c *19/00*
U.S. Cl. 166—.6 **7 Claims**



An underwater connecting apparatus for subsea control systems for wells drilled on the ocean floor and like areas. The connecting apparatus includes at least one female receptacle, a male stinger engageable in the receptacle and a spring mounting secured to the receptacle for flexing attachment to a wellhead.

3,820,601
WELL CAPPING DEVICE
George E. Walker, Jr., and Dean P. Hemphill, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Nov. 6, 1972, Ser. No. 303,889
Int. Cl. E21b *29/00*
U.S. Cl. 166—55 **6 Claims**



A well capping device for shutting off flow through a conductor includes explosive means to cut the conductor and means for moving a valve plate across the conductor subsequent to explosively cutting the conductor.

3,820,602
USE OF A SPACER COMPOSITION IN WELL CEMENTING
Herman R. Motley, Tulsa; Earl F. Morris, Wagoner, both of Okla., and Joseph P. Pavlich, Houston, Tex., assignors to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 172,304, Aug. 16, 1971, abandoned. This application June 12, 1973, Ser. No. 369,365
Int. Cl. E21b *21/00*, *33/14*
U.S. Cl. 166—291 **6 Claims**

A flowable composition is provided which can be employed as a spacer to separate particulate solid containing carbonaceous and aqueous fluids which are contained in or flowing through a container or conduit. The flowable composition

comprises a liquid hydrocarbon base with both an oil wetting and water wetting surfactant dispersed therein.

3,820,603

ALTERING RELATIVE PERMEABILITY IN PRODUCTION WELLS

Bruce L. Knight, John S. Rhudy, both of Littleton, and James H. Fullenwider, Aurora, all of Colo., assignors to ICI America Inc., Wilmington, Del.

Filed Nov. 6, 1972, Ser. No. 303,744
Int. Cl. E21b *43/22*
U.S. Cl. 166—295 **19 Claims**

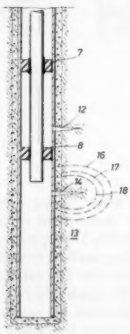
The water-to-hydrocarbon ratio of a production well is decreased by injecting into the reservoir in the immediate vicinity of the production bore hole an aqueous solution containing a water-soluble polymer obtained as a product of radiation-induced polymerization of acrylamide and/or methacrylamide and acrylic acid, methacrylic acid, and/or alkali metal salts thereof. The polymerization is preferably carried out in 10–60 percent aqueous monomer solution with gamma radiation. The mixture of monomers, before radiation, preferably contains 20–99 percent acrylamide and 80–1 percent sodium acrylate.

3,820,604

SELECTIVELY PERFORATING AND TREATING A CASED WELL

George T. Karnes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 7, 1972, Ser. No. 304,442
Int. Cl. E21b *29/00*
U.S. Cl. 166—297 **5 Claims**



A process for forming and individually treating perforations at different depths within a cased well is improved by forming a slidable mechanical seal between a tubing string and the casing, lowering the tubing string to near the top depth to be perforated, sealing between the tubing and the casing, forming and treating at least one perforation, and then repeating the sequence at different depths, while maintaining the slidable seal.

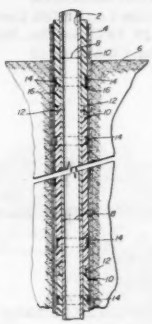
3,820,605

APPARATUS AND METHOD FOR THERMALLY INSULATING AN OIL WELL

Patrick A. Barber, Anchorage, Alaska, and Bruce B. Cleveland, San Pedro, Calif., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 115,240, Feb. 16, 1971, abandoned.
This application Dec. 29, 1972, Ser. No. 319,689
Int. Cl. E21b *43/00*
U.S. Cl. 166—315 **12 Claims**

An oil well is thermally insulated to prevent exchange of heat between the flowing oil and the strata surrounding the well. Sections of rigid polymer foam (preferably polyurethane or polyisocyanurate foam) are assembled in sealed relationship on the outside of the pipe through which the oil and like liquids flow, thereby forming a continuous barrier of insulation between said pipe and the well casing. The insulation is installed on the pipe as the latter is being assembled in accordance with normal practice, before being lowered into the well casing. The foam insulating sections preferably have a density of 2 pcf to about 40 pcf and have an outer surface and configuration which permits sliding engagement of the insulated pipe with the inner surface of the well casing.



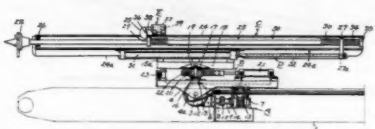
The insulation of the oil well in the above manner permits the satisfactory operation of oil-producing, or oil and gas producing, or gas producing wells drilled through permafrost and like frozen strata which would otherwise be subject to excessive thawing and irreversible structural change due to contact with heat transmitted from the oil or other fluids being pumped through the well. The insulation is also effective in overcoming problems encountered in oil and like wells drilled in the ocean floor. The oil being passed in such wells through the top section in contact with the ocean is frequently cooled to the point at which serious viscosity increases occur with resulting flow problems. This invention obviates these difficulties.

3,820,606

HIGH ALTITUDE BREAKING APPARATUS FOR FIRE FIGHTING

Fusaji Terayama, Osaka, Japan, assignor to Morita Fire Pump Mfg. Co., Ltd., Osaka, Japan

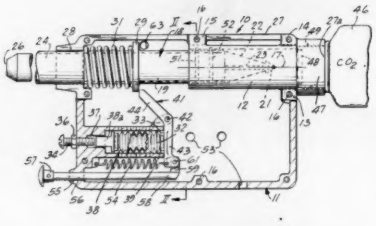
Filed Apr. 9, 1973, Ser. No. 349,482
Int. Cl. A62c *27/00*
U.S. Cl. 169—25 **2 Claims**



There is provided a novel high altitude breaking apparatus for fire fighting comprising a high altitude working vehicle for fire fighting having a breaking spear slidably mounted for stick-out and retraction on the tower top of said vehicle the arrangement being such that the tower top is brought close to a closed glass wall of a burning building with the breaking spear held in its retracted position and the breaking spear is forcefully stuck out from within its shooting range by the action of spring force to smash the glass wall to provide for spraying

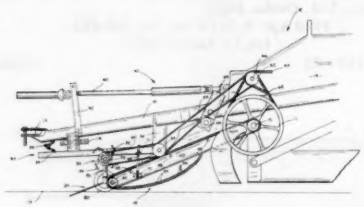
water into the room to extinguish the fire and for the rescue of the persons shut up in the room. The breaking spear is mounted for angle adjustment on the tower top so that it can be directed at right angles to the glass wall to ensure that the spear will positively and accurately break the glass wall. Further, the breaking spear is safely remotely controlled from the vehicle. Other merits and details of the construction will appear as the description proceeds.

3,820,607
HEAT ACTIVATED, SELF DISCHARGING FIRE EXTINGUISHER
George E. Miley, 933 Alden Ln., Buffalo Grove, Ill. 60090
Filed May 29, 1973, Ser. No. 364,896
Int. Cl. A62c *3/10*
U.S. Cl. 169—58 **10 Claims**



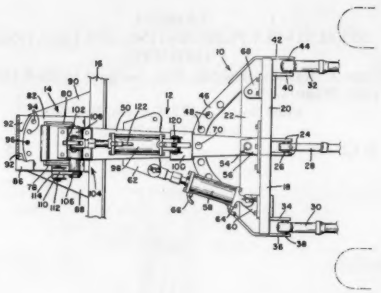
An automatic discharge fire extinguisher adapted to release flame retardant material upon exposure to a predetermined temperature. The extinguisher incorporates a spring loaded piercing device which is released by action of an expansion tube and which breaks the seal on a pressurized vessel holding the flame retardant material.

3,820,608
COMBINATION HARVESTING AND SALVAGING HEADER FOR PEANUT COMBINES
George W. Clark, Rt. 1, Box 121, and Nathan E. Winslow, Jr., 1729 N. Church St., both of Scotland Neck, N.C. 27874
Filed July 24, 1972, Ser. No. 274,463
Int. Cl. A01f *9/00*
U.S. Cl. 171—26 **4 Claims**



In abstract, a preferred embodiment of the present invention comprises a header for a peanut combine that is particularly adapted to harvest peanuts and the associated crop material above ground, or to salvage loose peanuts left on the ground after the above ground harvesting operation. In particular, the peanut header of the present invention comprises a main frame, a separator-conveyor associated with the header and operatively connected to the combine for conveying peanuts and crop material thereto, and a rotary harvesting mechanism disposed forwardly of the separator-conveyor for engaging and guiding the peanuts and associated crop material onto the separator-conveyor. To modify the header of the present invention to salvage loose peanuts from the ground, the rotary harvesting mechanism may be modified to include a plurality of ground engaging sweeping elements that are operative to engage the loose peanuts disposed on the ground and sweep them into the header, thereby salvaging the peanuts lost during the above ground harvesting operation. Alternatively, the header may be provided with a relatively narrow, transverse blade gauged to penetrate and lift a thin layer of soil and the loose peanuts lying thereon onto the separator-conveyor.

3,820,609
REAR-MOUNTED BLADE
Clarence Robert Trott, St. Catharines, Ontario, Canada, assignor to Deere & Company, Moline, Ill.
Filed June 29, 1972, Ser. No. 267,507
Int. Cl. A01b *65/00*
U.S. Cl. 172—447 **7 Claims**

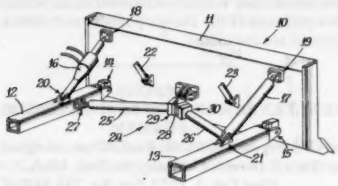


A rear-mounted blade having a mounting frame adapted for attachment to the three-point hitch arms of an agricultural tractor and a generally L-shaped main frame including a longitudinally extending portion connected at its forward end to the mounting frame for pivotal movement about a vertical axis, and a vertically extending portion rigidly fixed to and extending downwardly from the rear end of the longitudinal portion. A pivot pin extends longitudinally through the lower end of the vertical frame portion and has a blade carrier structure mounted thereon for pivotal movement about the axis of the pin, the carrier structure, in turn, having a transversely elongated blade pivotally connected thereto for relative movement about a generally vertical axis. Movement about the longitudinal axis of the pivot pin is imparted to the blade by means of a hydraulic cylinder disposed above the longitudinal frame portion and acting between the frame and one arm of a bell crank mounted thereon, the other arm of the bell crank being connected to the blade carrier structure by means of a vertically extending link.

3,820,610
BRACING ARRANGEMENT FOR BULLDOZER BLADES
Max D. Fryrear, Joliet, and James L. Harmon, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 8, 1972, Ser. No. 304,765
Int. Cl. E02f *3/76*
U.S. Cl. 172—803 **4 Claims**

A bulldozer has an upstanding blade pivotally connected to a pair of laterally spaced push arms adapted to be connected

to the frame of a tractor. A connector block is pivotally mounted on the back of the blade and has one end of a



diagonal brace universally connected to each side thereof. The opposite end of each brace is pivotally connected to a respective push arm.

3,820,611

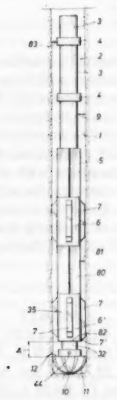
WELL DRILLING METHOD AND APPARATUS

Graham E. King, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 93,062, Nov. 27, 1970, abandoned. This application May 31, 1973, Ser. No. 365,531

Int. Cl. E21b *7/00, 17/10*

U.S. Cl. 175—57 **38 Claims**



A method and apparatus for preventing drilling bit vibration during rotation, thereby providing a straighter wellbore.

3,820,612

METHOD FOR LUBRICATING AN UNSEALED BORING BIT

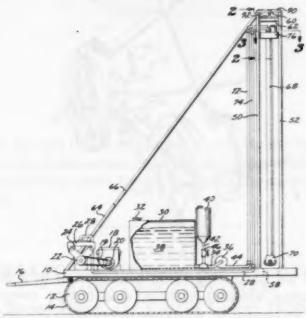
Raymond C. Snyder, 5131 Princeton, Westminster, Calif. 92684, and Paul F. Snyder, 14281 Hacienda, Huntington Beach, Calif. 92647

Filed Oct. 10, 1972, Ser. No. 295,858

Int. Cl. E21b *41/00*

U.S. Cl. 175—70 **10 Claims**

There is disclosed a method and apparatus for drilling in which air is circulated through a drilling stem to a subterranean drilling bit to assist the cutting action of the bit and in which water and a slight amount of certain organic additives are admixed with the air which is circulated through the drilling stem to the drilling bit. It has been found that water-soluble polyalkylene glycols, which are available under the trademarks Textilol and Ucon, as well as a synthetic sperm oil available under the trademark Nopco 14A, exhibit highly desirable properties for use as the organic additives. The apparatus for practice of the invention comprises a drilling rig with means to rotate a drilling stem and its dependent drilling bit and force the stem and bit downwardly into an earthen formation with means to circulate a gas stream, typically air, down the drilling stem and through passageways in the drilling



bit to cool and lubricate its bearing surfaces. The gas is discharged into the well bore and passes upwardly about the drilling stem, carrying debris and dust for discharge from the well bore at the earth's surface. The apparatus includes means for introducing a controlled flow of an aqueous suspension or solution of the aforedescribed organic additives into the gas stream.

3,820,613

ROLLER REAMER STABILIZER

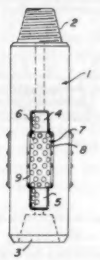
Kenneth M. White, Calgary, Alberta, Canada, assignor to Western Rock Bit Company Limited, Calgary, Alberta, Canada

Filed Mar. 12, 1973, Ser. No. 340,250

Claims priority, application Canada, Dec. 29, 1972, 160232

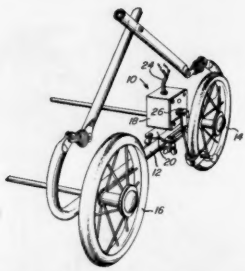
Int. Cl. E21b *9/24, 17/10;* **E21c** *23/00*

U.S. Cl. 175—337 **6 Claims**



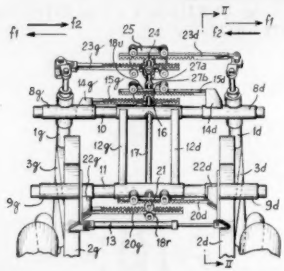
A roller reamer stabilizer the bearings of which are lubricated by air bleed from the centre core of the drill string. The roller cutters are mounted in recesses in the body such that the roller cutters are free to rotate about their bearing pins in suitable journal bearing blocks. The bearing blocks are provided with passage means from the centre bore of the drill string to provide the said air lubrication. The air also serves as a cushion between the roller and the bearings.

3,820,614
BABY CARRIAGE RECIPROCATOR
Leo Askinazy, 47 Whitman Dr., Brooklyn, N.Y. 11207
Filed Feb. 15, 1973, Ser. No. 332,572
Int. Cl. B62b *9/22*
U.S. Cl. 180—1 E **2 Claims**



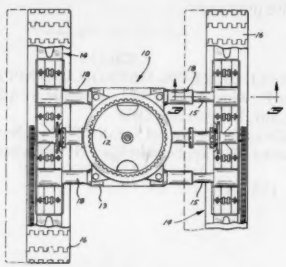
A device for producing reciprocal motion of a baby carriage, or other wheeled vehicle, said device comprising a motor with an eccentric, a linkage operatively connecting the eccentric to one of the carriage wheels, and means for conveniently mounting the motor to the carriage framework and permitting adjustment of the motor's spacing relative to the wheel to select the desired angular displacement of the reciprocal movement imparted to the wheel.

3,820,615
SELF-PROPELLED VEHICLE WITH WHEEL-GAUGE ADJUSTABLE DURING OPERATION
Emile Bobard, Beaune, France, assignor to Bobard Jeune, Beaune, France
Filed May 2, 1973, Ser. No. 356,482
Claims priority, application France, May 4, 1972, 72.16298
Int. Cl. B60k *33/00*
U.S. Cl. 180—1 F **4 Claims**



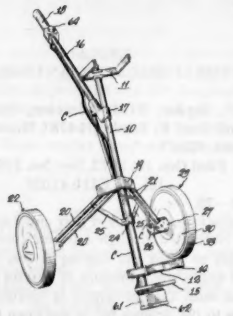
The vehicle described comprises: two side chassis structures respectively provided with driving and steering wheels and spaced-apart from each other by transverse members; driving and transmission means; means for varying the distance between to the two structures, actuated by driving means including at least one jack; operating means acting from a driving station for steering wheels including at least one composite coupling rod constituted by two transverse rods; and means for synchronizing the variations in distance apart of the structures and of the length of the coupling rod. One of the rods is provided in the form of a toothed rack in engagement with a toothed pinion and the synchronizing means comprise a further transverse toothed rack, similar to the said coupling rack and in engagement with another pinion similar to the said coupling pinion, and a longitudinal shaft of variable length provided at its two extremities with universal joints coupling the pinions together for rotation. The relative arrangements of the pinions on their respective toothed racks is adapted to the realtive positions of the chassis portions with which the racks and pinions are associated.

3,820,616
CRAWLER VEHICLE WITH DUAL EXTENSIBLE SIDE FRAMES
Dieter C. Juergens, South St. Paul, Minn., assignor to American Hoist & Derrick Company, St. Paul, Minn.
Filed Feb. 3, 1972, Ser. No. 223,252
Int. Cl. B62d *55/00*
U.S. Cl. 180—9.48 **10 Claims**



The crawler side frames of a crawler crane are slidably supported on axle-like members which, in turn, are slidably supported in the crawler crane carbody. The axle-like members are hollow and double acting hydraulic cylinder-piston motors are provided in each axle-like member for the purpose of moving the side frames with respect to the axle-like members, moving the axle-like members with respect to the carbody, and for the purpose of removing the side frames and removing the axle-like members. Limits and stops are provided for insuring accomplishment of precisely the desired degree of extension or retraction of each of the members with respect to another.

3,820,617
GOLF CARTS
Stephen A. Groff, 1857 Sheridan N.E., Warren, Ohio 44483
Filed Sept. 28, 1973, Ser. No. 401,844
Int. Cl. B62d *51/04*
U.S. Cl. 180—19 R **10 Claims**



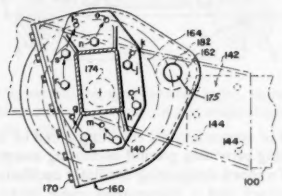
A powered, two-wheel golf cart having gearing disposed within a wheel and having direct drive connection with an

electric motor. The result is an economical, efficient drive for a two-wheel golf cart, which is free of bulky attachments so that the improved cart does not materially differ in appearance as compared to a conventional, non-powered cart. Efficient clutch mechanism is provided to selectively drive the cart, and enables the golfer to select whether to drive or pull the cart.

3,820,618
AXLE ADJUSTING MECHANISM FOR AGRICULTURAL MACHINES

Richard A. De Pauw, East Moline, Ill., and Tom G. Stamp, Davenport, Iowa, assignors to International Harvester Company, Chicago, Ill.

Filed June 29, 1973, Ser. No. 375,194
Int. Cl. B62d *33/08*
U.S. Cl. 180—70 R **8 Claims**



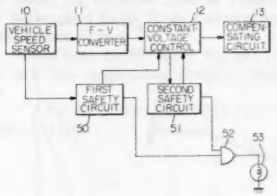
An axle adjusting mechanism for the dual front axle bars and the single rear axle bar of a combine harvester, wherein the ground clearance of the individual axles may be varied by relocating the axle supports on the combine chassis frame. Adjustment of the front axle bars is accomplished by unbolting the gearboxes or casings which carry the wheel drums and hubs from the chassis framework, effecting eccentric adjustments thereof, and then re-bolting the same in such adjusted positions to the framework, thereby changing the elevation of the framework, and consequently the axle bars which are supported thereby. Adjustment of the rear axle bars is carried out in a similar manner by unbolting the rear axle bar support from the chassis framework and raising or lowering such framework, as the case may be, relative to the support and re-bolting it in its adjusted position. Since no gearing is involved, no change in the angularity of the rear axle bar is resorted to. In the case of front axle bar adjustment, one set of bolt holes on each axle bar supporting member is designed for selective mating register with two sets of bolt holes on the chassis framework, while in the case of rear axle adjustment, one set of bolt holes on the chassis framework is designed for selective mating register with two sets of bolt holes on the axle bar supporting member.

3,820,619
ELECTRIC CONTROL CIRCUITRY FOR VEHICLE POWER STEERING DEVICE

Mitsuhiko Ezoe, and Naohiko Inoue, both of Yokohama, Japan, assignors to Nissan Motor Company Limited, Yokohama City, Japan

Filed Feb. 2, 1973, Ser. No. 329,067
Claims priority, application Japan, Feb. 5, 1972, 47-12553
Int. Cl. B62d *5/06*
U.S. Cl. 180—79.2 R **10 Claims**

A temperature-compensating circuit comprising a thermistor and a resistor connected in parallel to each other, the parallel combination being connected in series with a solenoid coil of a modulator valve. A vehicle speed sensor generates an AC current with a frequency proportional to vehicle speed. The AC current is converted by an F-V converter into a DC current of a magnitude proportional thereto which is then supplied to a constant-voltage control circuit so as to be converted into a voltage signal corresponding thereto. The voltage signal is supplied across the solenoid coil and the temperature-compensating circuit to cause a flow of current

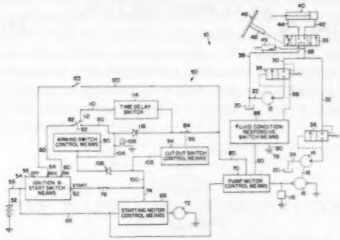


through the coil that corresponds exactly to the vehicle speed irrespective of the variations in the resistance of the coil which would otherwise result from changes in the surrounding temperature.

3,820,620
VEHICLE POWER STEERING ELECTROHYDRAULIC SAFETY BACKUP SYSTEM

Wayne Russel Miller, and Charles George Termont, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 29, 1973, Ser. No. 345,906
Int. Cl. B62d *5/06*
U.S. Cl. 180—79.2 R **11 Claims**



Disclosed is a vehicle power steering system including an electrohydraulic safety backup system for supplying fluid pressure to the steering motor of the vehicle when a main pump becomes inoperative to supply pressure fluid to the steering motor. The safety backup system includes an electrical circuit which is incorporated in the ignition and starting circuits of the vehicle such that the operability of the backup system is automatically checked at every starting of the vehicle. Also, the electrical circuit is "armed" in response to the starting circuit becoming energized during each starting of the vehicle engine. The electrical circuit includes a fluid condition-responsive switch which is closed to complete a circuit to a control for effecting the energization of an electric motor for driving an auxiliary pump when the fluid pressure being delivered by the main hydraulic pump becomes insufficient to adequately drive the steering motor.

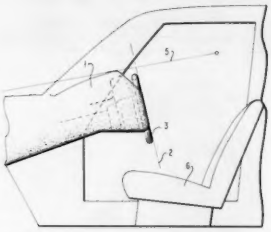
3,820,621
SAFETY INSTRUMENT PANEL

Werner Breitschwerdt, Stuttgart, and Hermann Renner, Boblingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Sept. 14, 1971, Ser. No. 180,377
Claims priority, application Germany, Sept. 17, 1970, 2045960
Int. Cl. B60r *21/04*
U.S. Cl. 180—90 **35 Claims**

A safety instrument panel for vehicles, especially passenger motor vehicles in which the instrument panel is extended into

the passenger space either over its entire width or only on the driver's side, up to the area of the steering wheel plane and is



provided within the area of the steering wheel rim with such a large aperture as is necessary for an unimpaired steering.

3,820,622

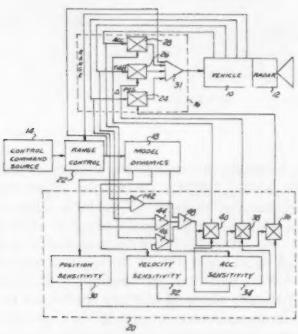
MODEL REFERENCED SPEED CONTROL FOR AUTOMOBILES

Barry K. Powell, Allen Park, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed July 30, 1973, Ser. No. 383,519

Int. Cl. B60k *27/00, 33/00*

U.S. Cl. 180—98 **14 Claims**



An automatic control system for a vehicle moving in a line of traffic controls the vehicle speed as a function of an input overall speed control signal, provided to all of the vehicles, and the distance to the preceding vehicle, as detected by a vehicular radar system. A controller receives the radar signal, the input control signal and a signal proportional to the vehicle speed and adjusts the propulsive and braking forces on the vehicle to modify the controller operation to accommodate changed system parameter variations such as vehicle loading and wind change. A signal derived from the input control signal and the radar unit are applied to a computer which models the ideal behavior of the controller and the vehicle in response to the particular input signals. The outputs of this model are compared to signals representing the actual vehicle performance to develop control signals to adjust the operation of the controller.

3,820,623

METHOD AND SYSTEM FOR SPEED CONTROL FOR VEHICLES

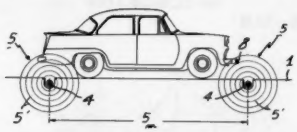
Hajime Akashi, Kyoto; Sosuke Iwai, Uji; Iwao Fujimoto, Komyoda; Hiroshi Hashimoto, Toyota; Tetsuo Abe, Tokushige; Akira Kato, Nagoya, and Masao Suzuki, Omimura, all of Japan, assignors to Sanyo Machine Works Ltd., Aichi-ken, Japan

Filed Oct. 20, 1971, Ser. No. 190,933

Claims priority, application Japan, Oct. 24, 1970, 45-93753; Oct. 23, 1970, 45-93793; Oct. 23, 1970, 45-93795; May 6, 1971, 46-30256

Int. Cl. B60k *31/00*

U.S. Cl. 180—98 **5 Claims**



A method of controlling the traveling speed of an automobile comprising providing ground oscillating assemblies each consisting of a speed-designating oscillator oscillating at a particular frequency and a transmitting cable embedded in a road; and a car mounted assembly consisting of a receiver unit including an induction coil adapted to obtain electromotive forces respectively corresponding to said particular frequencies by moving through magnetic fields produced by said transmitting cables as the induction coil moves over the transmitting cables, and a plurality of resonance circuits resonating under said electromotive forces with said particular frequencies, said receiver unit being adapted to obtain voltages each corresponding to a target car speed under the action of the resonance circuits, and a control unit adapted to compare such preset voltage with a voltage corresponding to the traveling car speed so that if there is a differential voltage such voltage is utilized to control the engine until the car speed becomes equal to the target car speed, said ground oscillating assemblies being located at desired places on a road so that a magnetic field having a frequency corresponding to a desired car speed is produced at each ground oscillating assembly. The invention also provides methods and apparatuses for controlling the traveling speed of an automobile, having sub-arrangements based on the principal arrangement described above. Advantages and particulars of such arrangements will be made clear.

3,820,624

ELECTRONIC SPEED CONTROL SYSTEM FOR VEHICLES

Naoji Sakakibara, Kiraya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi-ken, Japan

Filed Apr. 14, 1972, Ser. No. 244,087

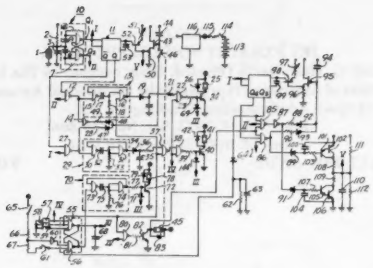
Claims priority, application Japan, Apr. 20, 1971, 46-25446

Int. Cl. B60k *31/00*

U.S. Cl. 180—105 E **10 Claims**

A control system for automatically maintaining a desired rate of travel of a vehicle by way of comparing an actual speed signal generated in response to a travelling speed of the vehicle with a standard signal generated to represent the desired travel rate of the vehicle. The system further comprises a synchronous pulse generator to generate with a slight delay a synchronous pulse corresponding to the actual speed signal, and a speed acceleration-deceleration compensating circuit

for compensating temporarily the standard signal in response to a width difference between a pulse converted from the actual speed signal and the synchronous pulse, thereby to essentially eliminate hunting, overshoot and undershoot of the vehicle under any cruising conditions.



3,820,625

HIGH-SAFETY COMPLEX LIFT WITH ELECTRONIC COLLECTIVE CONTROL

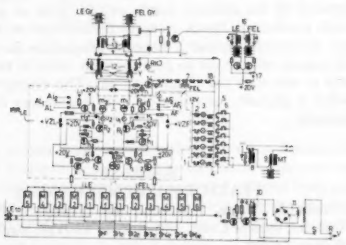
Istvan Balint, and Sandor Baumann, both of Budapest, Hungary, assignors to Licencia Talalmanyokat Ertekesito Vallalat, Budapest, Hungary

Filed Mar. 13, 1972, Ser. No. 234,004

Claims priority, application Hungary, Mar. 11, 1971, LI 217

Int. Cl. B66b *1/18*

U.S. Cl. 187—29 R **1 Claim**



Improvements in elevators operated in banks and also individually, in which the equipment may be adapted for the various requirements of apartment houses, hotels, office buildings and business establishments, by the addition of components to a basic control system which in any event will be relatively simple and inexpensive. When operated bankwise, the control system assures a desirable distribution of the workload, and also accommodates full loading of any individual elevator. The individual elevators have improved safety locks, improved brakes, improved sheave construction, improved speed control, improved load-limiting mechanism, and improved guide structure.

3,820,626

METHOD OF AND DEVICE FOR ATTENUATING THE NOISE PRODUCED BY A JET ENGINE NOZZLE

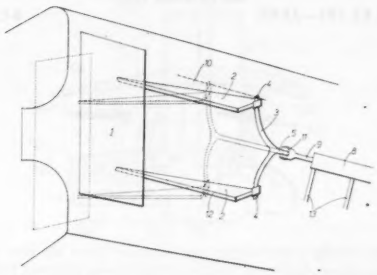
Henri Auguste Bonneaud, Dammarie-les-Lys, and Rene Gerard Hoch, La Rochette, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Sept. 22, 1972, Ser. No. 291,177

Claims priority, application France, Sept. 23, 1971, 71.34296

Int. Cl. B64d *33/06*; F01n *1/14*

U.S. Cl. 181—33 HC **2 Claims**



A method and device for attenuating the noise emitted by a jet engine nozzle for supersonic aircraft, the method consisting in pinching the jet issuing from the nozzle to spread the jet in a plane, and the device comprising a pair of oppositely disposed retractable panels or the like mounted within the nozzle and movable between a retracted inoperative position and an operative position in which they are effective to pinch the jet and thus spread it out in a plane so that a silencing effect is achieved in said plane.

3,820,627

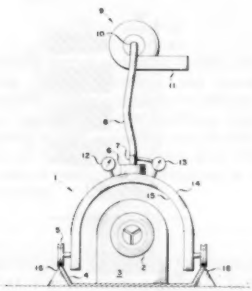
APPARATUS FOR NOISE AND AIR POLLUTION ABATEMENT

Leslie S. Wirt, Newhall, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Aug. 28, 1972, Ser. No. 284,423

Int. Cl. E04b *1/84*

U.S. Cl. 181—33 G **12 Claims**



A system for simultaneously controlling airborne noise and air pollutants. Comprises an acoustic panel or enclosure constructed of a permeable sheet separated by an air space from an impermeable sheet, and includes means for inducing a ventilating flow of air through the permeable sheet. The air flow and permeability of the sheet are selected to lie within a specified range such that $\Delta p/u \approx Z$ where Δp is the differential

pressure across the sheet, u is the velocity of air approaching the sheet, and Z is the characteristic impedance of air. Especially suitable for ventilating hoods, enclosures, or semi-enclosures for machine tools, spray booths, welding apparatus, and the like.

3,820,628

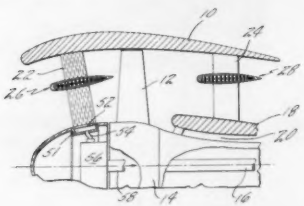
SOUND SUPPRESSION MEANS FOR ROTATING MACHINERY

Donald B. Hanson, Rockville, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 2, 1972, Ser. No. 294,400

Int. Cl. E04b *1/99*

U.S. Cl. 181—33 HC **6 Claims**



Boundary layer control for flow splitters, blading (stator and rotor) in the air path of a ducted fan of an air propulsor serves to reduce noise by minimizing the wake promulgated thereby particularly when such appurtenances are upstream of a rotating body. The effectiveness of sound absorbing means is enhanced by flowing a portion of the air in the air path through the material or means utilized to absorb noise energy. For appurtenances that create wakes in the air path, the boundary layer control serves the dual function of removing strata of boundary layer and conducts air from the air path through the sound suppressing material or means.

3,820,629

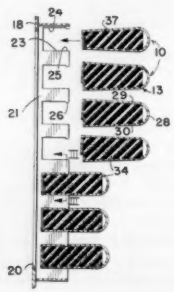
ACOUSTICAL LOUVER FOR EARTHMOVING VEHICLES

Robert D. Carlson, Plainfield; Jack H. Kraina, Aurora, and Robert C. Wegner, Oswego, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 2, 1973, Ser. No. 328,947

Int. Cl. E04b *1/84*; B62d *25/10*

U.S. Cl. 181—33 G **7 Claims**



A sound attenuation system having a plurality of acoustical louvers readily removably mounted across an air circulation opening in the engine enclosure of an earthmoving vehicle. Each acoustical louver includes an acoustical foam material batt mounted within an elongated D-shaped sheet material holder which has unattached overlapping end portions for allowing the compression of the holder and batt for facile manual installation in mounting rack slots disposed at opposite sides of said air circulation opening wherein the louver is held in place by spring tension which assures retention of the louver during use but allows rapid removal thereof, without recourse to special tools, for maintenance.

3,820,630

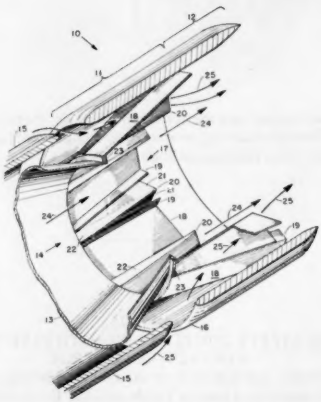
JET EXHAUST NOISE SUPPRESSOR

Ronald G. Huff, North Olmsted, Ohio, assignor to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 9, 1973, Ser. No. 339,806

Int. Cl. B64d *33/06*; F01n *1/14*

U.S. Cl. 181—33 HB **9 Claims**



Noise suppression for a jet engine exhaust is provided by an annular divergent body attached to an exhaust nozzle. The smallest diameter of the divergent body is larger than the diameter of the exhaust nozzle exit to form an annular step which produces a shock wave in the exhaust as it passes the step. An annular shroud is disposed around the divergent body and causes outside air to pass through voids in the divergent body to mix with the jet exhaust gas. The divergent body includes a plurality of channels with separators between the channels.

3,820,631

PLATFORM LIFT MECHANISM

Terrance M. King, Placentia, and Frank S. Pearne, San Gabriel, both of Calif., assignors to Aircraft Mechanics, Inc., Downey, Calif.

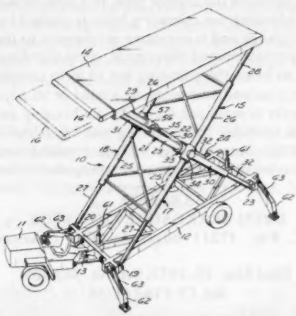
Filed Mar. 8, 1973, Ser. No. 339,417

Int. Cl. E04g *1/22*

U.S. Cl. 182—141 **8 Claims**

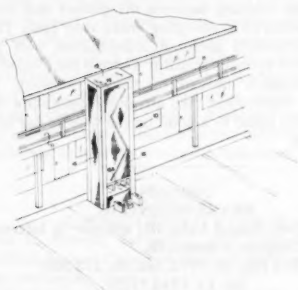
A work platform or cargo loader having a mobile base and a vertically translatable platform associated with the base is disclosed. The platform is connected to the base for translation by a linkage which includes a first pair of parallel struts each pivoted at one end to the base and pivoted at the other end to the platform so as to form acute angles with the base and platform. A second pair of parallel struts is provided with each strut pivoted at one end to the base and at the other end to the platform so as to form acute angles with the base and platform. Adjacent, non-parallel struts are pivotally connected to each other, and the pivoted mid-portion of each strut includes

oppositely directed, fluid power cylinders each having a ram mounted therein so that the struts are extensible along their



axes. Each ram is mechanically interlocked to each other ram to ensure substantially identical values of incremental movement among the rams even if the platform is unequally loaded.

3,820,632
BAGGAGE LIFT FOR MOTELS
Chester G. Jines, 320 S.W. Ln. No. 7, Portland, Oreg. 97202
Filed Oct. 19, 1972, Ser. No. 299,149
Int. Cl. B66b *9/00*
U.S. Cl. 187—3 **2 Claims**

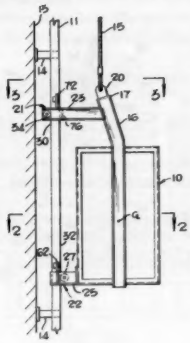


A lift for guests' baggage embodied within a framework alongside a multiple-storied lodging structure to permit the guest to on load luggage at ground level and off load from one of the structures exterior elevated walkways. A baggage carrier is movable within the framework into positions opposite openings in the framework wall structure for loading and unloading of the luggage and is of restricted internal area to prevent entry of persons into the carrier.

3,820,633
HOIST
James T. Thorp, Jr., Edwardsville, Ill., assignor to Champion Hoist Company, St. Louis, Mo.
Filed Dec. 6, 1971, Ser. No. 205,038
Int. Cl. B66b *7/02*
U.S. Cl. 187—95 **2 Claims**

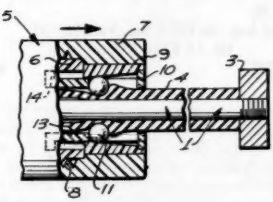
This hoist includes upper and lower rail-engaging roller assemblies and is suspended from a point offset from the center of gravity so that the upper and lower roller assemblies are urged into contact with the rail bearing surfaces.

The lower roller assembly includes a self-aligning mechanism by which the rollers are maintained in engagement with misaligned rail surfaces. The self-aligning mechanism includes a shaft having aligned end portions, which are jour-



naled into the hoist brackets, and oppositely cranked intermediate portions mounting the rollers, the rollers being automatically relocated under pressure from the hoist to compensate for rail misalignment.

3,820,634
SHOCK RESISTING ENERGY ABSORBING DEVICE
Lloyd Richard Poe, Los Angeles, Calif., assignor to Hartwell Corporation, Los Angeles, Calif.
Filed Aug. 10, 1973, Ser. No. 387,326
Int. Cl. F16f *7/12*
U.S. Cl. 188—1 C **9 Claims**

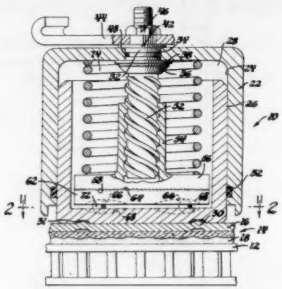


A shock resisting energy absorbing device, wherein one or more indenting elements engage and move along an elastomeric member to cause progressive deformation and attendant energy absorption, the indenting elements being backed by a spring in such a manner that should a shock load occur in excess of the normal working load, the energy absorption is increased proportionally resulting in increased resistance to movement.

3,820,635
SELF ADJUSTING DISC BRAKE WITH PARKING BRAKE
Harmon C. Hurt, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed July 23, 1973, Ser. No. 381,370
Int. Cl. F16d *65/56*
U.S. Cl. 188—71.9 **3 Claims**

Mechanical actuating means for a disc brake caliper includes a shaft rotatably journalled in the housing and having a threaded portion which threadedly engages a nut having integral circular plate. A second circular plate is interposed between the integral plate of the nut and the conventional

hydraulic actuating piston. A one-way clutch is provided by ratchet teeth on the adjacent faces of the integral plate and second plate. A ball and ramp arrangement is provided between the second plate and the piston. Rotation of the shaft in one direction causes the nut to rotate therewith and the ratchet teeth to rotate the second plate which in turn causes



the ball and ramp arrangement to move the piston axially to carry the brake shoe into engagement with the disc. Upon return of the shaft to its preactuation rotational position clearance will result in the mechanical actuating mechanism to an extent corresponding to the lining wear encountered. A spring causes the nut to rotate on the shaft in the direction axially toward the disc as permitted by ratcheting of the one-way clutch so that the effective length of the mechanical actuating mechanism is extended to adjust for the wear. Wear adjustment also occurs upon hydraulic actuation of the brake.

3,820,636

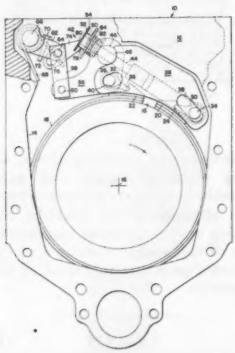
SELF-ADJUSTING CONTROL LINKAGE FOR AN EXTERNAL BAND BRAKE

John Joseph Kass, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Aug. 16, 1973, Ser. No. 388,735

Int. Cl. F16d *65/56*

U.S. Cl. 188—77 R **6 Claims**



An external band brake control linkage includes a pair of anchor pins which are respectively connected to the opposite ends of a brake band, the linkage being operable between a normal released condition holding the anchor pins spaced apart so as to maintain the band disengaged from the brake drum and an operative condition wherein the anchor pins are moved together from the position they occupy when the linkage is in its released condition wherein the brake band is engaged with the brake drum. For the purpose of compensating for brake band wear, the control linkage includes a link having a ratchet wheel-type adjusting nut threaded on a rod-like end thereof, the adjusting nut being advanceable so as to change the spacing between the anchor pins. In a first embodiment, a pawl or an adjusting nut operating lever is carried by a link of the control linkage and is operative in response to the link undergoing a predetermined movement, corresponding to brake band wear, to index the adjusting nut so as to compensate for the wear. In a second embodiment, a pawl or an adjusting nut operating lever is mounted on the brake housing and is positioned so as to index the adjusting nut when the latter has moved with the control linkage a predetermined distance corresponding to brake band wear to compensate for the wear.

3,820,637

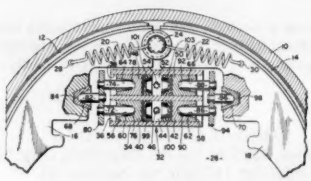
DRUM BRAKE SHOE ACTUATOR

Clarence C. Fay, 17211 Edgewater Dr., Lakewood, Ohio 44107

Filed Mar. 22, 1973, Ser. No. 343,809

Int. Cl. F16d *65/14*

U.S. Cl. 188—106 P **3 Claims**



There is provided in a dual hydraulic subsystem drum and brake shoe braking apparatus a dual subsystem hydraulic actuator having piston/cylinder assemblies communicating with separate hydraulic subsystems, and force-sensing and distributing means coacting between the pistons and centrally located abutments on confronting brake shoe ends. This apparatus is particularly useful in combination with a dual hydraulic master cylinder actuator wherein the pistons are in side-by-side relation instead of tandem relation, joined together by a "wobble bar" and driven by application of pressure from a foot pedal to a point on the wobble bar between the two pistons.

3,820,638

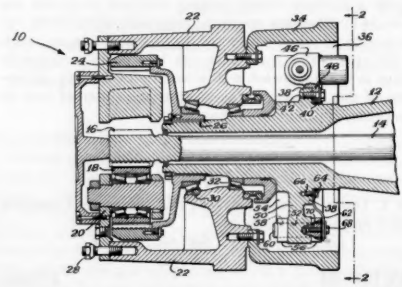
BRAKE MOUNTING

Edward W. Ebey, Round Lake, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Feb. 24, 1972, Ser. No. 228,858

Int. Cl. F16d *51/20*

U.S. Cl. 188—206 A **1 Claim**



An improved brake mounting which permits removal and installation of brake components from the inboard side of the

associated wheel having a pair of brake shoes pivotally mounted from the axle housing and a brake actuator attached to the axle housing. Pins pivotally mount the brake shoes and are releasably retained by a locking means attached to the axle housing and fastening means releasably secure the actuator to the axle housing. Both the locking means and fastening means are arranged to be manipulated solely through the open inboard end of the associated brake drum.

3,820,639

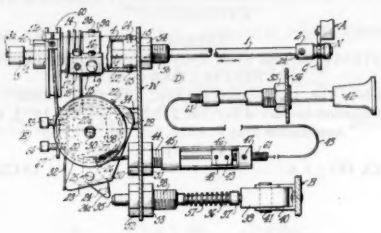
BRAKE RELEASED THROTTLE HOLDER

John J. Frueh, 806-W. 167th St., Gardena, Calif. 90247

Continuation-in-part of Ser. No. 306,717, Nov. 15, 1972, abandoned. This application June 25, 1973, Ser. No. 373,108

Int. Cl. B60k *29/02*

U.S. Cl. 192—3 T **10 Claims**



Mechanical assembly for installation on automobile to set carburetor fuel supply at whatever driving level has been obtained by operator-activated accelerator pedal, set merely by his pulling dashboard knob at such speed. Setting can be transiently overridden by further depression of accelerator which then automatically returns to prior setting upon release of foot pressure. Alternately any brake pedal activation completely discharges setting. Simple non-electrical unit employs free piston which is magnetically detachably coupled to axially traversing control rod which is distally attached to accelerator pedal. Rotationally operating clutch (activated by pull knob) locks piston to housing at selected control position, leaving control rod available for further overriding depression but restrained from retraction beyond piston-set position.

3,820,640

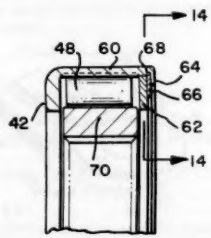
UNIDIRECTIONAL CLUTCH

Americo E. Marola, Torrington, and Gerard W. Gehrke, Litchfield, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Continuation-in-part of Ser. No. 140,092, May 4, 1971, Pat. No. 3,746,136. This application Aug. 31, 1972, Ser. No. 285,250

Int. Cl. F16d *15/00*

U.S. Cl. 192—45 **2 Claims**



A one-way clutch including an outer member containing a bore surrounding a spaced inner member with a full complement of rollers in side-to-side engagement located around the inner member between the two members. One or more control members may be spaced between the rollers to urge the rollers in a given rotary direction against wedging ramps provided on the surfaces of one of the members to engage the clutch for driving purposes.

The outer member may have flanges or washers extending radially inwardly to overlap the longitudinal ends of the inner member.

3,820,641

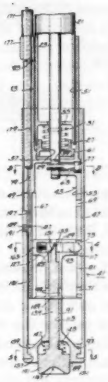
TILLER MOUNTED CLUTCH AND THROTTLE CONTROL

Gaylord M. Borst, and William Fuelling, Jr., both of Galesburg, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 65,498, Aug. 20, 1970, abandoned. This application Jan. 29, 1973, Ser. No. 327,768

Int. Cl. B60k *21/00*

U.S. Cl. 192—.098 **10 Claims**



Disclosed herein is an outboard motor including a combination clutch and throttle control which is rotatably mounted on the tiller of a propulsion unit and which includes a first member connected to a rotatable throttle control member for common rotary movement so as to control the throttle of the outboard motor engine and a second member which has a common rotary movement with the first member and which is movable axially of the first member and which is connected through a push-pull member to a remote clutch control member to effect clutch actuation in response to axial movement of the second member relative to the first member. Accordingly coordinated steering, speed, and clutch control can be accomplished by an operator using one hand on the clutch and throttle control assembly.

3,820,642

VEND CONTROL CIRCUIT WITH IMPROVED DEPOSIT REFUND AND ACCUMULATION MEANS

Joseph L. Levasseur, St. Louis, Mo., assignor to H. R. Electronics Company, High Ridge, Mo.

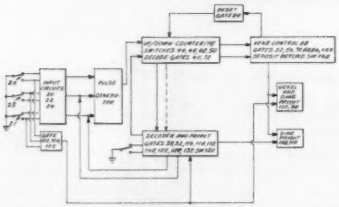
Filed June 29, 1972, Ser. No. 267,558

Int. Cl. G07f *11/00*

U.S. Cl. 194—1 N **22 Claims**

An improved control circuit for vending and other coin controlled machines with improved escrow means that do not require that the machine hold and return only the particular coins deposited but rather is able to make refunds of all of a deposit up until the vend price is deposited and from the regular machine coin changer means. The accumulator means in

the present control circuit are also novel in that once the amount of a deposit equals or exceeds a vend price the vend price is deducted from the amount accumulated so that thereafter only the excess deposited over the vend price need be accumulated and used to control the refunding operation. The present circuit is also versatile enough to be able to accommodate the coinage of any of the world's coinage systems with little or no modification, it includes means to overcome the problems inherent in existing control circuits wherein the deposited coins themselves must actuate one or more switches or sensors to control circuit functions, it obviates the problems that occur when more than one coin is simultaneously being detected, and the subject control circuit includes means to prevent malfunction due to the presence of undesirable electronic noise and transient conditions that may be accidentally or intentionally induced into the circuit. The present circuit also includes novel means to convert single pulses to one or more pulses when accumulating and when returning change



because of an over-deposit and also when the total amount of a deposit is to be refunded as in what is sometimes referred to as an escrow situation. This latter provision is especially important and advantageous in coinage systems where the lowest denomination coin used for making change in a coinage system may have more than one different combinational relationship with the other acceptable coin denominations. Also, being able to refund or escrow the total amount of a deposit regardless of its relation to the vend price, is unique to the vending art and eliminates the costly and expensive practice often used in vending centers and elsewhere of having to keep records of amounts due to customers who claim to have been cheated by the machines. This feature also prevents loss to the customer where the customer changes his mind after making a deposit or partial deposit or where he discovers that he does not have enough change to complete a desired purchase, or for some other reason wants his money refunded.

3,820,643

RECORDER HEAD FOR COMPOUND ALPHANUMERIC CHARACTERS AND CODE CHARACTERS

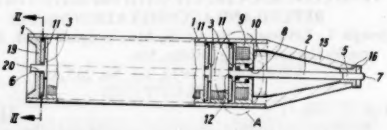
Horst Priebs, and Alfred Hecker, both of Bielefeld, Germany, assignors to Anker-Werke AG, Bielefeld, Germany

Filed Sept. 7, 1972, Ser. No. 287,052

Claims priority, application Germany, Sept. 9, 1971, 2145116

Int. Cl. B41j *3/50*

U.S. Cl. 197—1 R **8 Claims**



Recorder head for compound alphanumeric or code characters includes a cylindrical housing having front and rear slot guiding means, a plurality of flat and straight printing rods disposed in rows in mutual engagement and mounted in the front and rear slot guiding means, means having a type face located at the front end of said printing rods, respectively, electromagnet means coordinated with the printing rods for axially displacing the same into printing position, the printing rods being of equal length and being formed with reinforced sliding surface portions at mutually engaging regions thereof, the electromagnet means comprising pot-shaped magnets located one behind the other and formed with respective core bores, armature plates located adjacent and coordinated with the magnets, respectively, and also formed with respective bores, the plurality of printing rods extending in common through the core bores of the magnets and the bores of the armature plates, each of the printing rods having a stop operatively engageable by a respective armature plate in response to activation of a respective pot-shaped magnet for axially displacing the respective printing rod.

3,820,644

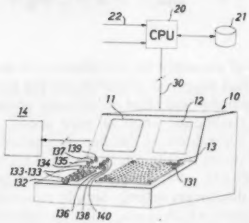
SYSTEM FOR THE ELECTRONIC DATA PROCESSING OF CHINESE CHARACTERS

Chan-Hue Yeh, 1501 California Ave., Alto, Calif. 94304

Continuation-in-part of Ser. No. 225,048, Feb. 10, 1972. This application May 7, 1973, Ser. No. 357,703

Int. Cl. B41j *3/50*

U.S. Cl. 197—1 A **33 Claims**



Method and apparatus for electronically processing bits of information, particularly Chinese characters where the information is Chinese characters or the like, the steps comprising digitally converting the Chinese character by means of a 480 point matrix and converting the digitalized character to 120 hexadecimal digit code units.

3,820,645

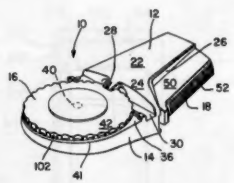
EMBOSSING TOOL

Bobby A. Davis, San Pablo, Calif., assignor to Dymo Industries Inc., Emeryville, Calif.

Filed Oct. 24, 1972, Ser. No. 300,269

Int. Cl. B41j *1/30*

U.S. Cl. 197—6.7 **11 Claims**



A hand held tape embossing tool of small dimensions in which the movement of the operating handle is in a plane parallel to that of the embossing dies. The tool is therefore relatively flat and may be conveniently carried in the user's

pocket. A minimum number of parts are required, and except for metal fastening screws and two metal spring members, the entire tool is injection molded from suitable plastic material. The small number of parts results in low production costs while still providing proper and adequate operational characteristics.

A novel form of embossing punch is utilized which has a cam actuated relationship with the operating handle. Tape feed is provided by a knurled feed wheel which is resiliently urged towards the tape strip to insure adequate frictional contact therewith. The feed wheel is rotationally moved during return movement of the handle, i.e., after the embossing operation, and a unique detent is provided to prevent contra rotation of the wheel.

3,820,646

PROGRAMMED VERTICAL TABULATING DEVICE FOR TYPEWRITER

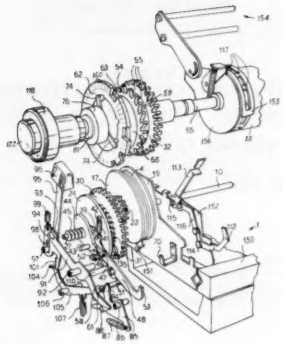
Mario Lombardi, Ivrea, Italy, assignor to Ing. C. Olivetti & Co., S.p.A., Ivrea (Torino), Italy

Filed May 13, 1971, Ser. No. 143,018

Claims priority, application Italy, May 19, 1970, 68716/70

Int. Cl. B41j *19/76*

U.S. Cl. 197—114 R **24 Claims**



A vertical tabulating device for an electric typewriter including a carriage carrying a rotatable platen is described. The return movement of the carriage of the typewriter, with which the device is associated, is obtained by power-pulling a flexible member connected with the carriage of the typewriter. The device is characterized in that the rotational movement of the platen is actuated by a drum disposed on the carriage. The flexible member has one end fastened to the drum and normally has a section thereof wound about the aforementioned drum by resilient means. The drum actuates rotation of the roller through a transmission; movement of the roller is arrested by locking means controlled by a programming disk rotatable with the roller.

3,820,647

SLICE PRE-ALIGNER

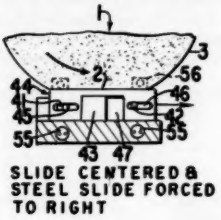
James Harry Waugh, Jr., and Darien S. Fenn, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 14, 1973, Ser. No. 397,540

Int. Cl. B65g *47/24*

U.S. Cl. 198—33 AB **15 Claims**

A pre-aligning device for slices of hard material such as silicon or germanium having flats on their peripheries comprising a laterally slidable block having a flat surface which is biased toward the slice periphery, and on which the flat of a slice is adapted to seat. The slide block has at least one elongated slot extending parallel with its said surface into which a rigidly supported pin extends to limit the extent of lateral sliding of the block which is engaged by the periphery of the slice and which occurs when the slice supported as by a rotatable vacuum chuck is rotated. When the flat of said slice engages the flat surface of the slide block, it is detected as by photocells and means to stop driven rotation of the chuck and slice



is activated. The flat of the slice however overshoots the surface of the block before complete stoppage of chuck rotation occurs. At such time, the bias of the slide block towards said slice effects a limited counter rotation of the slice and full seating of its flat on said flat slide block surface. The slide block is slidably carried on a support having a surface which has a low coefficient of friction on which the slide block rests.

3,820,648

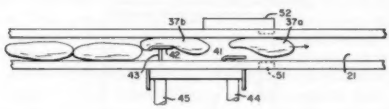
CONTROL SYSTEM FOR FEED OF ARTICLES

Gary A. Halvorsen, San Jose, Calif., assignor to Genevieve I. Hanscom, Santa Cruz, Calif.; Robert Magnuson and Lois Thomson, Trustees of the Estate of Roy M. Magnuson, part interest to each

Filed Nov. 10, 1972, Ser. No. 305,496

Int. Cl. B65g *47/26*

U.S. Cl. 198—34 **5 Claims**



A control system is provided for discharge of articles in timed relation in a processing system where the articles are fed in single file along a path ending at a discharge station. A pair of holding elements are placed in tandem relation to engage the last and next to last articles before the point of discharge and thereby restrain the flow of the oncoming articles from behind. A control system is provided to initiate and control automatic feeding of the articles.

3,820,649

DEVICE FOR THE GROUPING OF DISC-SHAPED ARTICLES, PARTICULARLY BISCUITS

Rene Fluck, Neuhausen am Rheinfall, Switzerland, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Apr. 12, 1972, Ser. No. 243,136

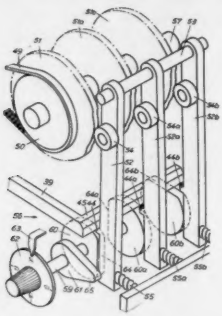
Claims priority, application Switzerland, Apr. 16, 1971, 5580/71

Int. Cl. B65g *47/26*

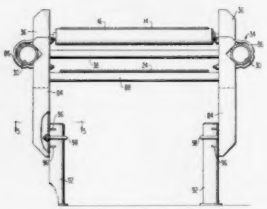
U.S. Cl. 198—35 **3 Claims**

A device for packing disc-shaped articles, such as biscuits, in groups in which the articles are supplied from a number of parallel channels coming from a source of supply, for instance an oven. The articles are introduced into a number of upright

chutes to form stacks therein, from the lower ends of which the articles are selectively ejected in singles and in pairs by a transversely movable slide member having fingers in such a manner that each group of articles will consist of a mixture of articles having different thicknesses, but all packages formed by the groups have the same over-all length, even though they may contain a different number of articles.



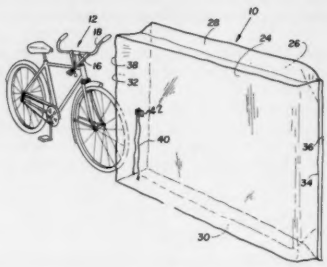
3,820,650
SANITARY ENDLESS BELT CONVEYOR
Francis J. Garvey, Newfield, N.J., assignor to Garvey Corporation, Blue Anchor, N.J.
Filed June 28, 1972, Ser. No. 267,062
Int. Cl. B65g *15/60*
U.S. Cl. 198—204 **5 Claims**



An endless belt conveyor system, intended particularly for the handling of food materials and ingredients, medicaments and the like, in bulk or in containers during the filling operation, is formed of modules and other components capable of being readily assembled and disassembled in a wide range of selected elements to provide installations of different desired lengths and heights, mounted by structural framing and other parts joined in point contact or very short line contact so as to leave minimal space for the lodging of spilled material and other foreign matter and facilitate periodic cleaning by steam, water jets or the like.

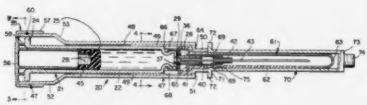
3,820,651
DETACHABLE PLASTIC SHIPPING BAGS
Alfred W. Levy, 50 Salem Ridge Dr., Huntington, N.Y. 11743
Filed Nov. 13, 1972, Ser. No. 305,940
Int. Cl. B65d *27/10, 85/66*
U.S. Cl. 206—390 **1 Claim**

Comparatively large plastic bags, each having the requisite size to accommodate a conventional two-wheel bicycle therein during its shipment and, despite such size, convenient to handle because the bags are detachably connected end-to-end and put up in a supply roll from which each bag is readily removed one at a time when needed. Each bag also has a removable portion which advantageously serves as a tying strip for holding the bicycle handle bars in the plane of the bicycle and thereby facilitating its placement within the bag.



ERRATUM
For Class 206—508 see:
Patent No. 3,820,685

3,820,652
PACKAGED SYRINGE CONSTRUCTION
Thomas Thackston, 2 Esterbrook Ln., Moorestown, N.J. 08034
Filed Nov. 14, 1972, Ser. No. 306,449
Int. Cl. A61m *5/00*
U.S. Cl. 206—365 **11 Claims**



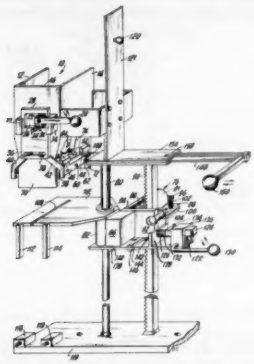
A cylinder for containing medicine having one end closed and a piston in the other end, a needle mounted on the closed cylinder end in a storage position exteriorly of the cylinder and shiftable to a used position impaled through the closed cylinder end, an open ended outer protector or shield about the cylinder having an internal shoulder adjacent to the closed cylinder end and an end closure on the end adjacent to the piston, and a needle sheath extending into the shield past the shoulder where it is provided with a retaining enlargement, so that the cylinder and needle are completely enclosed.

ERRATUM
For Class 206—520 see:
Patent No. 3,820,684

3,820,653
PACKAGE OF CUT FILAMENTS
Gilbert Shaw, Middlebury, and Charles H. Anderson, Jr., Shoreham, both of Vt., assignors to Polymers, Inc., Middlebury, Vt., by said Gloria E. Shaw, Executrix of said Gilbert Shaw, deceased
Division of Ser. No. 714,597, March 20, 1968, Pat. No. 3,589,409. This application Nov. 19, 1970, Ser. No. 91,139
Int. Cl. B65d *85/00*
U.S. Cl. 206—525 **7 Claims**

A filament package comprising a closed flexible sack containing cut filament packaged essentially parallel to each other

and essentially normal to the length of the sack. In packaging the cut filament within the flexible sack, the filament is fed into an opened end of the sack with the filaments essentially in parallel relationship to each other and essentially normal to the length of the sack while maintaining a movable temporarily closed end in the sack between the permanent ends thereof. The movement of the intermediate temporarily closed end is



coordinated with the filament feed so that cut filament controllably moves into and within the sack and into contact with cut filament already properly aligned therein without incident. The package of the invention provides many advantages over conventional brush or brush type fiber packages in cost, handling and use by, for example, brush or artificial Christmas tree makers.

3,820,654

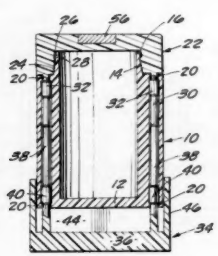
SAFETY CONTAINER

Alfred S. Colella, 1310 S. Glendora Ave., West Covina, Calif.

Filed Aug. 16, 1972, Ser. No. 281,224

Int. Cl. A45c *13/10, 13/18*

U.S. Cl. 206—1.5 **11 Claims**



A safety container for medicines and the like having a body portion closed at the bottom and opened at the top and having a plurality of longitudinally extending passages therethrough.

There is a cap or closure for the open end of the body having a plurality of rods for removable insertion of the upper ends of said passages, said rods having slightly enlarged free end portions which extend into slight enlarged parts of the passages at their upper ends and a key for the lower end of the body, said key having rods extending upwardly for reception in the lower portions of said passages, said rods being of sufficient length to force the rods of the cap out of the passages when the key and the body are moved toward each other a pre-determined distance, the rods of the key having enlarged portions engagable with restricted portions of the passages to limit outward movement of the rods of the key. The key is provided with flange means slidable on the exterior of the body and positioned on the body when the key is moved to a position whereat the enlarged parts of its rods engage the restricted portions of the passages.

3,820,655

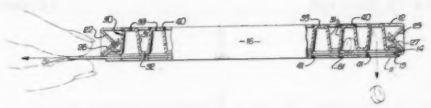
ARTICLE HOLDING AND DISPENSING CONTAINER

Charles La Tourette, Los Alamitos, and Patrick E. Mullen, Los Angeles, both of Calif., assignors to Consolidated/Eureka Paperbox, Inc., by said La Tourette and RX Pak Company, both of Los Angeles, Calif., by said Mullen

Filed Mar. 24, 1972, Ser. No. 237,772

Int. Cl. B65d *83.04*

U.S. Cl. 206—42 **7 Claims**



A container for holding and dispensing individual articles has a transparent compartmented article holding tray with an associated frangible closure formed from a single sheet of material with individual, separable pull tabs maintained in operable pre-pulled closed condition relative to said tray by an associated cover having dispensing apertures aligned to the tray compartments normally closed by said pull tabs. The pull tabs are provided with indicia on an underside viewable through the transparent bottoms of the tray compartments to facilitate noting the number of articles dispensed and/or retained in the tray. In one version of the container, the closure, cover and associated panels forming a sleeve-like body foldable about the tray with end closing flaps are die cut from a single sheet of paper stock or plastic material. In another version, a cover panel, with dispensing apertures cut therein is secured directly to top portions of the dispensing tray with the closure positioned therebetween, the associated pull tabs lying in guide channels formed in upper portions of the tray. In each version of the container disclosed, the pull tabs of the closure comprise one or more individual longitudinally extending tabs formed integrally of one another from a sheet of material with non-cut interconnecting portions of that material joining such tabs while in their assembled tray closing position prior to pulling of any one or more of the tabs for sequential dispensing of individual articles from the associated tray compartments, such interconnections being frangible upon manual pulling of associated ends of said tabs.

3,820,656

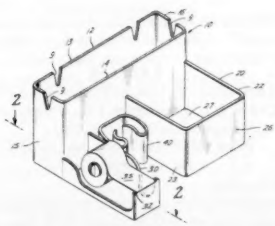
COMPARTMENTED CONTAINER

Kathleen C. Orr, 4617 Mimosa, Bellaire, Tex. 77401

Filed Aug. 21, 1972, Ser. No. 282,522

Int. Cl. B65d *1/36, 25/20*

U.S. Cl. 206—72 **2 Claims**



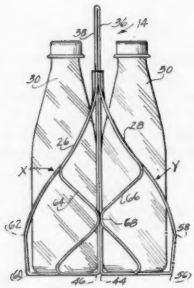
A compartmented container includes an elongated container forming a back or base of the compartmented container

with second and third containers or compartments extending therefrom on one side of the elongated container. The second and third compartments are in spaced relation with clamp means therebetween and secured to the elongated container for supporting the compartmented container arrangement on a rod or pole.

3,820,657
CONTAINER CARRIER

Mindaugas Julius Klygis, Evergreen Park, and Ronald Charles Owen, Harwood Heights, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 20, 1972, Ser. No. 219,328
Int. Cl. B65d *75/00*
U.S. Cl. 206—166 **5 Claims**



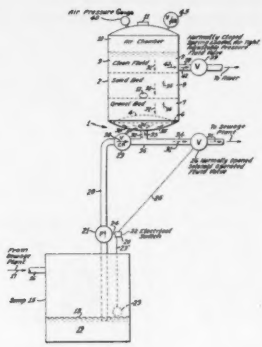
The present invention relates generally to improvements in manually transportable carriers for accommodating a plurality of containers, as for example bottles and the like, and more particularly to container carriers of the reusable type comprised of a single foldable sheet. An embodiment of the invention disclosed herein comprises a novel foldable sheet including adjacently positioned, substantially parallel bottom sections for supporting the bottom surfaces of a plurality of containers, and a vertically disposed central wall section the upper portion of which provides a handle. Sidewalls extend upwardly from the outer margins of the bottom sections, the upper portions of which telescopically accommodate the handle. The sidewall sections are provided with vertically elongate container-receiving openings defined by edges of predetermined shape positioned to engage the peripheries of supported containers for securing said containers against lateral displacement.

3,820,658
SELF CLEANING FILTER APPARATUS AND SYSTEM

Alonzo J. Cruze, Jr., Jacksonville, Fla., assignor to Dixie Water Treatment Company, Jacksonville, Fla.

Filed July 5, 1972, Ser. No. 269,147
Int. Cl. B01d *23/16*
U.S. Cl. 210—104 **12 Claims**

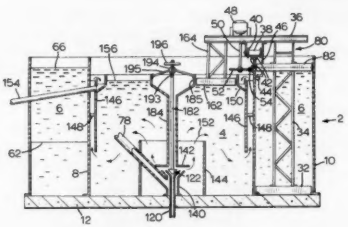
An intermittently operated pump passes waste fluid through a check valve into an upflow closed filter tank apparatus to produce clean fluid which may be used or discharged. When the pump stops a valve opens and the clean fluid then remaining in the tank is forcibly back washed by the air pressure in the tank through the filter material and through the valve back to a source. An adjustable pressure valve is in line with the clean fluid discharge and an air check valve passes air into the tank after each back washing occurrence. A float and switch controls actuation of the pump and the closing of the valve.



3,820,659
DISSOLVED AIR CLARIFIER

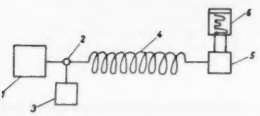
Joseph N. Parlette, Pickering Village, Ontario, Canada, assignor to L. S. Love & Associates Limited, Brampton, Ontario, Canada

Filed Feb. 20, 1973, Ser. No. 334,038
Int. Cl. C02c *1/10*
U.S. Cl. 210—195 **8 Claims**



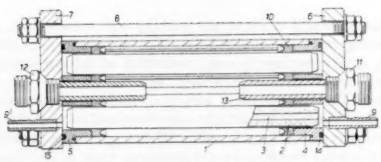
A two stage clarifier having an outer annular laminar flow gravity clarifier tank encircling an inner circular dissolved air flotation clarifier tank, both tanks sharing a common wall. A common drive mechanism drives a sludge scraper in the outer tank and a scum skimmer in each tank. Part of the clarified effluent from the outer tank is gravity fed to the inner tank; the remainder is gravity fed to a pressure tank, pressurized with air, and discharged by air pressure, without pumps, into the inner tank through a conduit having a pressure relief valve at an end in the inner tank. Since the air pressure is released in the inner tank rather than in the conduit, the flotation efficiency is improved.

3,820,660
FLUID ANALYTICAL INSTRUMENT
Istvan Halasz, Kleeberstrabe 16, 6 Frankfurt am Main; Hans Otto Gerlach, Im Kusler, 427 Altendorf-Ulfkotte; Karl Friedrich Gutlich, Oppenheiner Strabe 45, 6 Frankfurt am Main, and Peter Walkling, Dieckmann Weg 2, 216 Stade, all of Germany
Continuation of Ser. No. 798,358, Feb. 11, 1969, abandoned. This application Feb. 2, 1973, Ser. No. 329,142
Claims priority, application Germany, Feb. 15, 1968, 1675313
Int. Cl. B01d *15/08*
U.S. Cl. 210—198 C 5 Claims



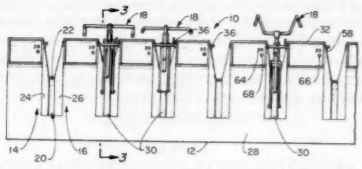
A tubular element of non-circular cross section for conveying fluids gaseous or liquid for use in fluid analyzing apparatus where the composition of the fluid more or less suddenly changes. The shape reduces overlapping of compositions. A tube of elliptical cross section is improved when major and minor axes of ellipse alternate along length of tube as by twisting the tube or providing 90° offset pinches to a round tube. Additional efficiency is obtained when the tube with the alternating positions of axes is wound into a helix of the order of 10 mm diameter.

3,820,661
APPARATUS FOR THE TREATMENT OF A LIQUID PARTICULARLY BY REVERSE OSMOSIS
Michel Pages, Ardeche, France, assignor to Societe Des Usines Chimiques Rhone-Poulenc, Paris, France
Filed Apr. 23, 1971, Ser. No. 136,859
Claims priority, application France, Apr. 24, 1970, 70.15146
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 4 Claims



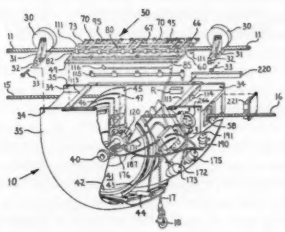
Apparatus particularly useful in reverse osmosis, dialysis or ultrafiltration, having a plurality of porous tubular supports coated with a semi-permeable membrane fitted in a casing consisting of an annular sleeve with a guide plate at each end. A fluid to be treated is communicated to the exterior of the porous tubular supports, while product fluid is obtained from the interior of the porous tubular supports. The guide plates slidably mount in holes therethrough the ends of the porous tubular supports while the ends of the casing are closed by end plates clamping the guide plates in position relative to the casing.

3,820,662
BICYCLE LOCKING APPARATUS
Thomas Grant Steers, 22605 Marlin Pl., Canoga Park, Calif. 91304
Filed Jan. 18, 1973, Ser. No. 324,581
Int. Cl. B62h *3/08*
U.S. Cl. 211—5 7 Claims



A bicycle locking apparatus wherein the front wheel of the bicycle is to be located within an opening within a frame, a bolt to be movable from one side of the frame to the other side across the opening, the free end of the bolt to cooperate with a retaining means to lock such in its latched position, the bolt being pivotal to its latched position, a coin-operated locking means mounted within the frame to retain the bolt in the latched position, the bolt including a stranded wire cable extending throughout the interior of the bolt.

3,820,663
SKYLINE CLAMP FOR LOGGING CARRIAGE
Norman E. Junes, 3 Box 148, Astoria, Oreg. 97103, and William R. Stanyer, 1715 Franklin, Seaside, Oreg. 97138
Division of Ser. No. 153,984, June 17, 1971. This application Aug. 17, 1973, Ser. No. 389,369
Int. Cl. B66c *21/00*
U.S. Cl. 212—99 6 Claims



The carriage is moved back and forth on a skyline by which drums on a yarder at one end of the skyline. The carriage contains a three-section cable drum having individual sections for a main line, a haulback line and a hoisting line. A hydraulic brake in the carriage operates on the three-section drum and a hydraulic clamp operates on the skyline. When the carriage drum brake is set and the skyline clamp released, the yarder winch drums pull the carriage out by winding in the haulback line and slacking off the main line. The yarder winch drums pull the carriage in by winding in the main line and slacking off the haulback line. When a turn of logs is to be lifted by the carriage for travel back to the yarder, the skyline clamp is set and the carriage drum brake released. The logs are lifted by causing the yarder main line winch to pull in the main line while the haulback line is slacked at the yarder.

The skyline clamp and drum brake in the carriage are actuated by a special leak-proof hydraulic system. A hydrostatic transformer provides a high pressure source of hydraulic fluid for the clamp. The hydraulic system is supplied by a bi-rotational pump operated by rotation of the carriage cable drum and pressurized oil is stored in an accumulator when the pump is not operating. Valves for actuating and releasing the brake and clamp are radio controlled by an operator at the yarder. To facilitate putting the carriage on the skyline and removing it from the skyline, the skyline clamp is made accessible by a hinged frame so that the skyline does not have to be threaded lengthwise through the clamp shoes. A movable clamp shoe extending substantially the length of the carriage is actuated by a plurality of hydraulic cylinders spaced along the shoe to provide quick and positive clamp and release movements and avoid sliding wear on the skyline cable.

3,820,664

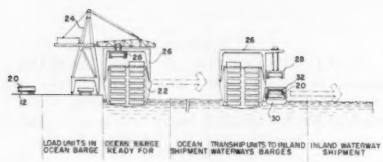
APPARATUS FOR TRANSPORTING FACTORY CONSTRUCTED HOUSING UNITS

Eugene C. Lewis, 1136 U.S. Highway 22, Scotch Plains, N.J. 07092; C. Robert Gottlieb, One Office Pk., Mobile, Ala. 36609, and Robert H. Macy, P.O. Box 758, Pascagoula, Mich. 39567 Division of Ser. No. 163,935, July 19, 1971.

This application Sept. 21, 1972, Ser. No. 291,036

Int. Cl. B65g *67/02*; **B63b** *27/10*

U.S. Cl. 214—14 **6 Claims**


LOAD UNITS IN OCEAN BARGE
OCEAN BARGE READY FOR
OCEAN SHIPMENT
TRANSHIP UNITS TO INLAND WATERWAYS BARGES
INLAND WATERWAY SHIPMENT

A system including method and apparatus for transporting and placing on site foundations factory constructed housing units, completely finishing interiorly to provide integral and mechanically operable living spaces ranging in size to a maximum floor area in excess of 4000 square feet. The system includes coordinated transfer and transporting units, the latter units including both marine vessels and land vehicles, which with the transfer devices are capable of maintaining at all times throughout overall system operation of factory shipping and project phases, a continuous foundation-like support to supply substantially the same measure of structural integrity to the housing unit as that supplied by a permanent foundation. The housing units of which the interior is finished completely at the factory, including interior painting, carpeting and draperies as well as other operational units such as kitchens, bathrooms, heating and airconditioning units and the like, is, after placement on the permanent site foundation, completed exteriorly by on-site placement of roofs, exterior appendages such as garages, porches, large items of exterior trim, exterior chimneys and the like.

3,820,665

BOTTOM HANDLING APPARATUS FOR STEEL CONVERTER VESSELS

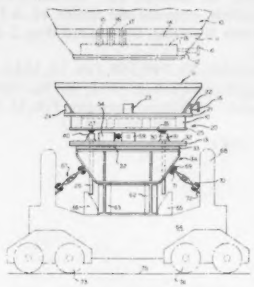
Howard M. Fisher, New Castle, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Mar. 16, 1972, Ser. No. 235,056

Int. Cl. C21c *5/50*

U.S. Cl. 214—1 D **8 Claims**

The bottom handling apparatus is adapted for being mounted on a ladle car or the like and comprises a base on which a turntable is rotatably mounted. A lift frame is supported on jacks which are in turn supported on the turntable.



A single motor drives the jacks through speed reducers and individual clutches.

3,820,666

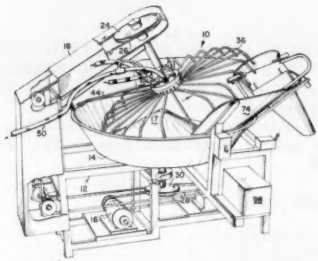
APPARATUS FOR PICKING UP AND TRANSFERRING LIGHT ARTICLES

Norman H Nye, 1348 Highbridge Rd., Cuyahoga Falls, Ohio 44223, and Arthur T. Medkeff, 260 Fawnwood Dr., Tallmadge, Ohio 44278

Filed June 29, 1972, Ser. No. 267,701

Int. Cl. B66 *1/02*

U.S. Cl. 214—1 BV **5 Claims**



Apparatus and method for picking up, transferring and depositing light flexible articles. The apparatus includes a driven rotary member having a plurality of tubular arms extending from circumferentially spaced portions of the member. The ends of these arms pass through a portion of a receptacle in which the articles are stored and suction is set up on these arms at their ends as moved through the receptacle to attract articles thereto. An air discharge blast is provided in the arms when the articles are to be released.

3,820,667

ARTICLE HANDLING MACHINE

Arthur J. Critchlow, and Charles J. Bryson, both of San Jose, Calif., assignors to Materials Management Systems, Inc., San Jose, Calif.

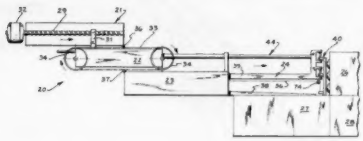
Filed Dec. 12, 1972, Ser. No. 314,453

Int. Cl. B66c *9/18*

U.S. Cl. 214—1 BT **11 Claims**

An article handling machine incorporating the combination of an elongate, rigid tine member, means for moving the tine member to a position adjacent one of the articles to be stacked or otherwise moved and a movable picker arm carrying suc-

tion means at the outer end thereof to engage a cardboard case or other article to be moved. Means are provided for advancing the picker arm and suction means from a retracted to an advanced position to dispose the suction means into confronting engagement with the article. Means for adhering the suction means to the article includes a vacuum source for adhering the suction means to the article in an upwardly disposed shear plane at the interface defined therebetween.



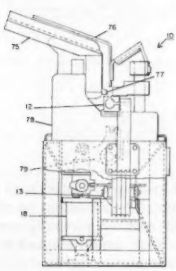
Means for lifting the suction means so as to also lift the article via the shear plane are provided as well as means for relatively moving the picker arm with respect to the tine member so as to dispose the article at least partly onto the tine member whereby the tine member can then be moved to carry the article to a desired location. Means for straightening the article as it is drawn along the tine member are provided as well as means for insuring that the article is lifted before it is moved.

3,820,668

BAR END POSITIONER

Robert J. Hesslein, Fayetteville; Robert W. Chamberlin, and Gerald B. Lanphere, both of Central Square, all of N.Y., assignors to Lipe Rollway Corporation, Syracuse, N.Y.

Filed June 11, 1973, Ser. No. 368,715
Int. Cl. B65h *5/16*
U.S. Cl. 214—1.5 **11 Claims**



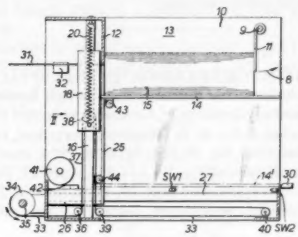
A bar end positioner for face-off of a new bar is applied to a magazine bar feeder having a stock tube and a cable drive for feeding bars to a bar working machine. The bar end positioner includes a gate movable to block off the end of the stock tube and a stock stop valve for detecting the engagement of a bar end with the gate. When the stock stop valve operates, a movable clamp closes onto the cable and then the gate moves clear of the stock tube so that the cable and the bar advance until the clamp reaches a stop and the bar reaches a face-off position. This starts the bar working machine which then releases the clamp so it returns to its start position.

3,820,669

APPARATUS FOR EJECTING STACKS OF ARTICLES FROM CONTAINERS

David Wood, Clevedon, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, England

Filed Nov. 28, 1972, Ser. No. 309,987
Claims priority, application Great Britain, Dec. 1, 1971, 55685/71
Int. Cl. B65g *59/06*
U.S. Cl. 214—8.5 SS **7 Claims**



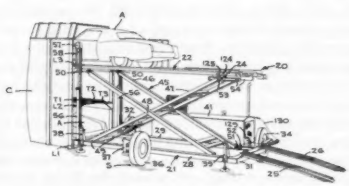
Apparatus for automatically ejecting stacks of mail from the individual sorter boxes in an automatic mail sorting machine, includes a vertically movable platform below a magazine, and a horizontally movable pusher for ejecting stacks of mail off the platform. The pusher and platform are both controlled from a common drive shaft via a clutch bobbin controlling a single tension cord which provides a differential output. A bight in the cord is connected to the platform and another length of the cord extending horizontally is connected to the pusher. The platform is spring balanced and interlocks are provided so that when tension is applied to the cord, or the cord is released, a selected one of the two movable parts moves before the other in a controlled cycle.

3,820,670

AUTOMOBILE SHIPPING CONTAINER UNLOADER

James J. Pizzo, and William W. Elliott, both of San Jose, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Mar. 12, 1973, Ser. No. 340,485
Int. Cl. E04h *6/06*
U.S. Cl. 214—16.1 DB **6 Claims**



Shipping containers having a plurality of storage levels, one superimposed above another, are used on railroad flatcars to support and enclose automobiles during transit. At each storage level in the shipping container, tracks are provided to receive the automobile wheels. Additional tracks are provided to receive restraints slidably fitted therein for interconnecting an automobile with the shipping container. A device for unloading automobiles from such shipping containers includes a mobile chassis with an elevator platform mounted thereon having an extractor arranged to project into the shipping container, automatically grip the restraints connected to an automobile, draw the automobile by the restraints from the shipping container onto the platform, and hold the automobile

in place on the platform while the platform is in an elevated position. A trip mechanism is provided for automatically releasing the restraints when the platform is lowered to a position where the automobile can be driven from the platform. The extractor, which is mounted for reciprocal movement on the platform, has at least one arm extending therefrom with gripping jaws mounted at the distal end for engaging a restraint, and a guideway is provided on the platform for directing the arm to slide into the track holding the restraint. A linkage connected to the gripping jaws is coupled to a trip lever that can be pivoted when the platform is lowered so that the automobile will be released.

3,820,671

APPARATUS FOR TRANSPORTING RECEPTACLES

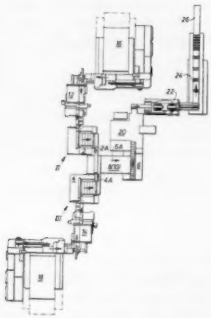
Bernhard Schubert, Neu Bornsen, and Dietrich Bardenhagen, both of Hamburg-Lohbrugge, Germany, assignors to Hauni-Werke Korber & Co. K. G., Hamburg-Bergedorf, Germany

Continuation of Ser. No. 30,204, April 20, 1970, abandoned, which is a division of Ser. No. 631,504, April 17, 1967, abandoned. This application Sept. 27, 1972, Ser. No. 292,630

Claims priority, application Germany, Apr. 18, 1966, 5915070

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 C **10 Claims**



An automatic transporting apparatus for cigarettes which comprises receptacles circulating along an endless path having portions disposed in several vertical planes extending between one or more filling devices which fill the receptacles with blocks or groups of cigarettes and an evacuating device which evacuates the cigarettes from filled receptacles for introduction into a packaging machine. The cigarettes extend transversely of the bottom walls of the receptacles and the conveyor system of the transporting apparatus includes two superimposed storing units in one of which filled receptacles advance sideways toward the evacuating device in such a way that the cigarettes move axially. Empty receptacles move sideways through the other storing unit toward the filling device. The other storing unit is located above the one storing unit.

3,820,672

DEVICE FOR DISCHARGING MATERIAL FROM A SILO

Stig Ove Gustafsson, Karlstad, Sweden, assignor to C. J. Wennberg AB, Karlstad, Sweden

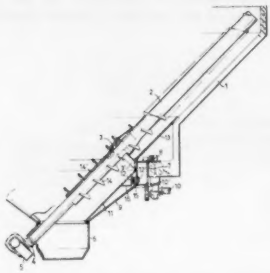
Filed Jan. 23, 1973, Ser. No. 326,105

Claims priority, application Sweden, Feb. 3, 1972, 1274/72

Int. Cl. B65g *65/46*

U.S. Cl. 214—17 DA **5 Claims**

The invention relates to a device for discharging material from a silo at its lower end, the silo having a funnel-shaped bottom for wood chip, pulverulent materials and the like and the discharging device consisting of a conveyor screw placed above the silo bottom, which screw is both rotatable about its longitudinal axis and journaled in a revolving ring by upper and lower bearings, whereby the screw can receive a reciprocating or rotational sweeping motion over the silo bottom. The revolving ring supports an annular part on which the material is to be moved towards the bottom opening, said annular part being rotatably mounted relative to the revolving ring so as to prevent the material inside the upper bearing of the screw from taking part in or counteracting the sweeping motion of the screw.



3,820,673

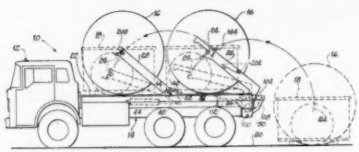
LOADING AND UNLOADING MEANS FOR CABLE REELS AND OTHER STRUCTURES

Arthur K. McVaugh, Vernfield, Pa., assignor to Champion Corporation, Hammond, Ind.

Filed June 5, 1972, Ser. No. 259,876

Int. Cl. B60p *1/48*

U.S. Cl. 214—77 R **20 Claims**



A mechanism for loading structures such as cable reels onto a supporting bed and for unloading the structures from the bed. The mechanism employs pivotally mounted arms having engaging means at their ends adapted to engage rods associated with the structures to be lifted onto or off of the bed. The arms are mounted on a shaft with the mounting means permitting adjustment of the arms along the shaft whereby the spacing between the arms can be varied to accommodate structures of different sizes. The arms are preferably supported on a frame which can be removably mounted on the bed. Transfer arms associated with the bed are preferably employed whereby structures moved onto the bed can be moved by the transfer arms to a separate location on the bed thereby permitting loading of additional structures on the bed. The transfer arms are also preferably associated with frame structures which are removably supported by the bed. Latch means which facilitate engaging, locking and releasing of the structures are associated with the arms, including the transfer arms. These latch means may be manually and automatically operable.

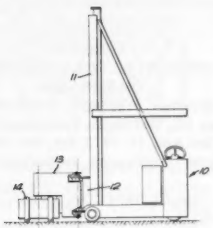
ERRATUM

For Class 214—313 see:
Patent No. 3,820,496

3,820,674
INDUSTRIAL LIFT TRUCKS

Cecil Goodacre, and Peter Alfred Leggett, both of Basingstoke, England, assignors to Lansing Bagnall Limited, Basingstoke, England

Filed May 4, 1973, Ser. No. 357,381
Claims priority, application Great Britain, May 8, 1972, 21444/72
Int. Cl. B66f *9/14*
U.S. Cl. 214—730 **4 Claims**

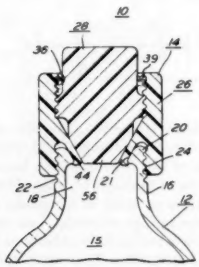


An industrial lift truck which has a carriage movable up and down a mast and a turret with forks on the carriage. The turret carries two movably mounted stops which co-operate with fixed abutments to provide different limits of movement of the turret according to the direction in which the forks face.

3,820,675
SAFETY BOTTLE DEVICE

Raymond W. Malles, Cedar Ln., P.O. Box 20, Wycombe, Pa. 18980

Continuation-in-part of Ser. No. 254,431, May 18, 1972. This application Aug. 10, 1972, Ser. No. 279,380
Int. Cl. A61j *1/00*; **B65d** *55/02*
U.S. Cl. 215—9 **20 Claims**

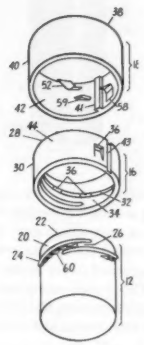


A safety closure means for a bottle having a neck portion with an extending end providing an opening therethrough and an outer surface with threads thereon, said closure means comprising a first outer member having top and bottom ends, an intermediate portion, and an opening therethrough providing an internal surface, said first member being provided with threads on its internal surface at its top end and with threads on its internal surface at its bottom end advancing in a direction opposite to the threads at its top end, said first member being removably securable with the threaded neck of a bottle by threaded engagement therewith, and a second inner member received into the opening of said first member and having a outer surface provided with threads threadedly engaging the threads of said first member at its top end, said second member having a bottom end extendible into the bottom of said first member, said closure means being secured with said bottle and sealing the opening through its neck when said first member threadedly engages the neck of said bottle and is secured thereon and said second member is placed in its closed position by turning it in the direction to advance its bottom end toward the bottom end of the first member covering the opening in the end of the neck of said bottle.

3,820,676
SAFETY CLOSURE ASSEMBLY AND CONTAINER

Michael Mucsi, 2474 S. Centinela Ave., Los Angeles, Calif. 90064

Continuation-in-part of Ser. No. 243,807, April 13, 1972, Pat. No. 3,790,014. This application Dec. 7, 1972, Ser. No. 311,707
Int. Cl. B65d *43/02*
U.S. Cl. 215—9 **9 Claims**



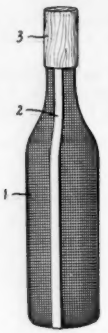
A safety package structure is provided comprising an externally threaded container and closure assembly therefor which includes an internally threaded cap for the container and a cover for the cap. The cover and cap are provided with corresponding and mating guide members to align the assembly, to permit longitudinal movement of the cover with respect to the cap and to impart torque to the cap. Yieldable means are disposed between the cover and the cap to maintain the cover in an axially compressible, predetermined uncompressed position. The cap side wall is provided with transverse apertures positioned on the path of and extending through the internal thread. Longitudinally resilient, ramplike ratchets are laterally disposed on the inner surface of the cover side wall so as to extend through the cap side wall apertures for releasably interlocking with corresponding detents in the thread groove on the neck of the container when the cover is in the uncompressed position. The configuration of the ratchets and detents is such that the ratchets will easily slide into and out of successive detents and, thus, permit conventional closing of the container by ordinary rotation of the closure assembly relative to the container. Reverse rotation of the closure assembly relative to the container is prevented by corresponding locking side walls on the ratchets and detents which are in planes substantially in alignment with radii to the center of the package. The closure assembly is removed from the container by simultaneously rotating the assembly and pressing on the cover top wall to move the cover to a compressed position whereby the ratchets, which follow the movement of the cover side wall, are withdrawn from the detents. Upon release of the pressing force, the yieldable means bias the cover to its original uncompressed position which realigns the ratchets to releasably interlock with the detents when the closure assembly is threadedly secured to the container.

3,820,677

BOTTLES WITH PROTECTIVE AND DECORATIVE COVERINGS

Jose M. S. Garcia, Fuenmayor, Spain, assignor to Age Bodegas Unidas, S.A., Fuenmayor (Logrono), Spain

Filed July 2, 1971, Ser. No. 159,385
Claims priority, application Spain, Aug. 17, 1970, 161119/70
Int. Cl. B65d *11/16*
U.S. Cl. 215—12 R 9 Claims



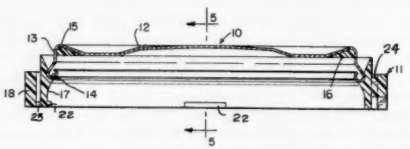
Bottles with protective and decorative seamed fabric coverings comprising a fabric covering which is permanently secured to the bottle, a cap, which may be of metal or plastic, or of the same fabric which covers the bottle, and a sealer sealing and securing the seamed cover in the concavity at the bottom of the bottle. The bottle covering may also include a sealer for sealing and concealing the fabric seam which is exposed outside of the concavity, and a plate and filler for the concavity.

3,820,678

TAMPER-PROOF CLOSURE

Donald H. Zipper, Western Springs, and Elmer J. Boik, Lombard, both of Ill., assignors to Continental Can Company, Inc., Chicago, Ill.

Filed Sept. 5, 1972, Ser. No. 286,178
Int. Cl. B65g *67/02*
U.S. Cl. 215—40 5 Claims



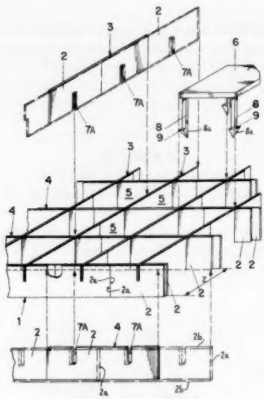
A two-part tamper-proof composite closure for press-on application on and pull-off removal from a vacuum sealed container. One part is in the form of a gasketed closure lid having a top panel and a depending skirt terminating in a bottom circumferential bead or curl. Preferably the bead or curl is curled inwardly rather than outwardly. An annular gasket is located within the shell at the outer margin of the top panel. As a second part, a plastic fitment or retainer is provided for the lid in the form of a ring or band body having an outer lift ring circumferentially spaced and integrally connected to the band body at a connection that serves as a hinge and at circumferentially spaced frangible connections. The inner ring or band body has an inner annular groove with an upper lip extending somewhat over the circumferential bead or curl on the bottom of the lid skirt so as to retain the parts in assembled relationship. When the frangible connections between the outer lift ring and the inner ring or band body are broken the outer lift ring can be pulled upwardly to first break the vacuum seal between the gasket and the top seal finish of a container and then to completely pull the composite closure from the container mouth. Preferably, the ring or band body is provided with a plurality of circumferentially spaced inner lugs that cooperate with an undercut or downwardly facing shoulder on a container for mechanically retaining the composite closure cap in place thereon either before a vacuum seal has been formed or after the cap has been reclosed following removal from a sealed package. A continuous flange may be used in lieu of the spaced inner lugs. If desired, the spaced inner lugs or continuous flange may be relied on to retain the composite cap in place in a hermetically sealed relation without presence of a vacuum.

3,820,679

CELLULAR STRUCTURE FOR ELECTRICAL MODULES OR THE LIKE

Hans Erich Schweitzer, Wettingen, Switzerland, assignor to H. E. Schweitzer AG, Wettingen, Switzerland

Filed Apr. 16, 1973, Ser. No. 351,505
Claims priority, application Switzerland, Apr. 17, 1972, 5656/72
Int. Cl. B65d *1/36, 5/48, 57/00*
U.S. Cl. 220—22.3 22 Claims



A cellular skeleton frame for separable modules has intersecting and interfitted longitudinal and transverse walls each of which consists of two rows of panels having registering cutouts for reception of portions of walls. The walls are assembled without screws or bolts in a manner known from eggcrates or boxes for storage of bottles, and their panels may be provided with detent means for yieldably or releasably holding the walls against separation from each other. The modules have elastic legs or grooves which can engage with the panels surrounding the respective cells and the frame can be reinforced by annular springs which can support apertured plates for lamp sockets or analogous parts. The panels of each wall can be provided with elastic parts to engage and hold threaded carriers for electrical or electronic components.

3,820,680

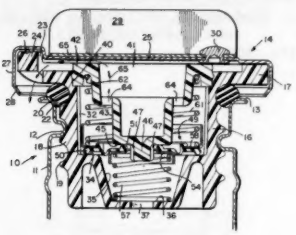
TORQUE-LIMITING DEVICE

Dawson Friend, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Tenn.

Filed Nov. 20, 1972, Ser. No. 307,820
Int. Cl. B65d *41/04*
U.S. Cl. 220—39 R 11 Claims

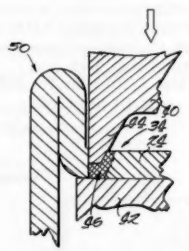
A valved cap for closing a chamber having a filler neck formed to provide an internal thread and a peripherally ex-

tending lip at its mount, the cap comprising a housing formed to provide, at its outer end portion, an outwardly extending flange and, extending axially inwardly from the flange, a shank with a mating external thread. A concentric sealing ring is disposed adjacent the flange for sealing engagement with the lip, and a shell covers at least the outer portion of the housing and is rotatable relative to the housing about the axis of the shank. The flange provides at least one resilient finger having



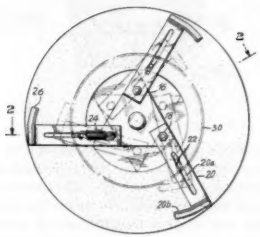
a lug at its distal end, and the shell provides at least one pocket for receiving the lug and providing a driving connection between the shell and the housing. This pocket is formed with a camming surface at its trailing end as the shell is turned to advance the shank inwardly and an abrupt surface at its leading end. The camming surface is effective to cam the lug out of the pocket to break the driving connection when the torque resistance to rotation of the housing in the said one direction exceeds a predetermined level.

3,820,681
SCORE-LINE STRUCTURE
Murlin L. Hulse, Cassopolis, Mich., assignor to Orbital Container Corporation, Addison, Ill.
Filed Apr. 6, 1972, Ser. No. 241,563
Int. Cl. B65d *17/20*
U.S. Cl. 220—54 **12 Claims**



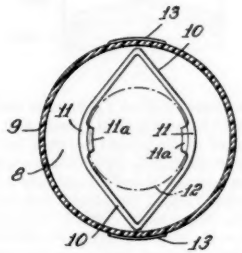
The present disclosure pertains to a novel score-line construction for easy-opening pull tab type cans, as well as a method for forming said score-line. In this regard, the score-line is disposed closely adjacent to the rim of the container end portion, and includes a substantially perpendicular outer peripheral wall. This arrangement provides, upon formation, a zone of compacted material immediately below the base wall surface of said score-line, which zone has an outer peripheral edge that terminates abruptly and substantially in alignment with the aforementioned perpendicular outer wall surface. Accordingly, upon opening, the path of fracture will follow said outer peripheral wall and be substantially coextensive with the edge of said zone, precluding erratic fracturing of said score-line and the formation of relatively sharp burrs. In addition, there are disclosed several novel can end element constructions for a container of the type described, employing a score-line terminating at spaced locations on a debossed area formed in the end portion. Fracture of the score-line will continue until the debossed area is reached, and thereafter further application of opening force will cause the displaceable panel section defined by the score-line to be bent upwardly about said debossed area. Accordingly, access to the can interior can be had, while the displaceable panel section remains connected to the can proper.

3,820,682
COVERING ARRANGEMENT FOR OPENINGS AND OPTICAL LENSES
Nicholas J. Davella, 2 Given Ct., Hauppauge, N.Y. 11787
Filed May 3, 1972, Ser. No. 249,907
Int. Cl. B65d *45/28*
U.S. Cl. 220—55 K **6 Claims**



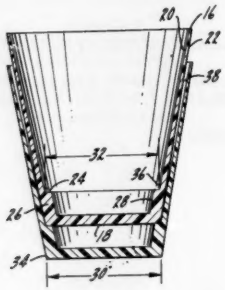
An arrangement for protecting and covering circular openings and lenses of optical devices. A padded circular disc is provided with a rotatable shaft through its center. A triangular-shaped cam is mounted on the shaft and rotatable therewith. Three arms pivoted at the three vertices of the cam move to-and-from the outer diameter of the disc upon rotation of the shaft.

3,820,683
SPRAY CAN SAFETY CAP
Andrew S. Jasinski, 407 Flanders Ln., Grayslake, Ill. 60030
Filed Feb. 10, 1972, Ser. No. 225,161
Int. Cl. B65d *55/02*; **B67d** *5/32*
U.S. Cl. 220—60 A **4 Claims**



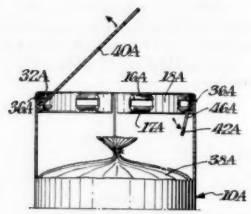
A cap for an aerosol spray can has an inner skirt which serves the dual functions of compound leaf spring to urge detents which engage the underside of the spray assembly collar inwardly and as a lever to disengage the detents for removal of the cap.

3,820,684
PLASTIC CUP
James M. Harrison, Fort Worth, Tex., assignor to Crest Container Corporation, Fort Worth, Tex.
Continuation of Ser. No. 107,968, Jan. 20, 1971, abandoned.
This application Oct. 13, 1972, Ser. No. 297,477
Int. Cl. B65d 21/02, 1/16
U.S. Cl. 206–520 2 Claims



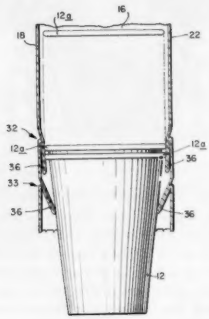
This is concerned with a so-called foam cup of the type made of foam polystyrene or the like intended to be used in vending machines for either hot or cold liquids and having a differential taper between the surfaces on the outside and inside of the side wall so that the surfaces of such cups when nested will contact only in a minute or highly restricted area, if at all, thus rendering them suitable for use in vending machines.

3,820,685
TUBULAR CARTON
Howard Reisman, c/o J. Reisman & Sons, Rt. 130, Pennsauken, N.J.
Filed Oct. 30, 1972, Ser. No. 302,264
Int. Cl. B65d 5/06, 21/00, 21/02
U.S. Cl. 206—508 16 Claims



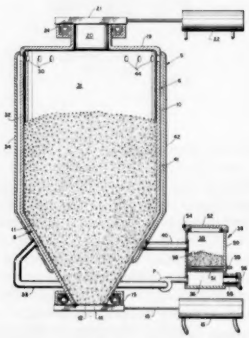
A paperboard tubular carton has circular end closures or lids engaged within both ends of its tubular wall. The lids are removably engaged in identations between laterally spaced pairs of projections disposed a short distance within the ends of the walls. The projections and indentations are provided in a slotted extension band of the tubular wall folded and attached within the ends. The portions of the band coextensive with the slots bow inwardly to provide the indentations which receive the lid. Inclined score lines in the band at the ends of the slots help concentrate the inward bowing in the vicinity of the slots. Additional strength and security are provided by stapling a pair of diametrically opposite tabs from the lids within the edges of the tubular walls. Positioning of the tabs and staples on the lines, at which the tube is folded flat before assembly, holds the creased parts round. A small perforated section around one tab is separated by the purchaser to make the remainder of the lid removable from the bowed indentations about a hinge provided by the other tab. Holes in the small section of the lid facilitate separation of the lid sections and carrying. Tapering of the tube facilitates stack nesting of the cartons on top of each other.

3,820,686
DISPENSER CARTON AND BLANK FOR FORMING SAME
Walter J. Tyrseck, Quaker Hill, Conn., assignor to Robertson Paper Box Co., Inc., Montville, Conn.
Filed Sept. 14, 1972, Ser. No. 289,105
Int. Cl. A47f 1/08; B65d 5/72
U.S. Cl. 221—305 5 Claims



A carton for dispensing articles such as paper cups is formed from a single blank of material. The carton has four wall panels arranged to form a tube. One or more peripheral pleats are formed in the panels near one end of the carton so as to create resilient tabs which lay out away from the carton wall panels. These tabs resiliently engage the lowermost article in a stack of nested articles within the container so that the articles can be pulled one-by-one from the end of the carton.

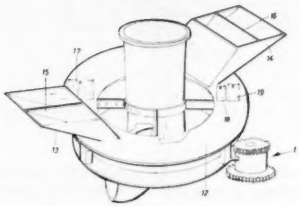
3,820,687
APPARATUS FOR PROVIDING A NON-REACTING ATMOSPHERE WITHIN A STORAGE BIN
James Donald Brock, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.
Filed Mar. 5, 1973, Ser. No. 338,365
Int. Cl. B67d 5/08
U.S. Cl. 222—53 7 Claims



Means for providing a non-reacting atmosphere within a storage bin wherein the fluid comprising the atmosphere is removed from the storage bin, the fluid is passed through a converter to convert the reacting components of the fluid to

non-reacting components, and the fluid is replaced in the storage bin. In asphalt storage bins, the reacting component in the fluid is oxygen, and the converter includes high temperature carbon to convert the oxygen to carbon dioxide.

3,820,688
MATERIAL DOSAGING APPARATUS
Heinrich Weiste, 4771 Sieningsen, Germany
Filed Aug. 13, 1973, Ser. No. 388,244
Claims priority, application Germany, Aug. 24, 1972, 2241534
Int. Cl. B67d *5/54*
U.S. Cl. 222—193 **11 Claims**

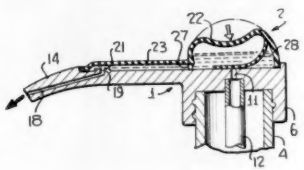


A dosaging apparatus for pneumatically operating distributor systems is disclosed, for the distributing of material in particle form such as seed goods, fertilizers and other granulates, having a dosaging apparatus connected with a supply hopper and provided with an inlet hopper, and having an air supply duct which is connected with the dosaging apparatus and opens into a conveying conduit for the dosaged material, through which the material is supplied to distributors.

ERRATUM

For Class 222—196 see:
Patent No. 3,820,697

3,820,689
ELASTOMERIC PUMP
Arliene N. Cocita, 11506 Newport Mill Rd., Wheaton, Md. 20902
Continuation-in-part of Ser. No. 246,176, April 21, 1972, abandoned. This application Apr. 12, 1973, Ser. No. 350,622
Int. Cl. B65d *47/34*
U.S. Cl. 222—207 **12 Claims**

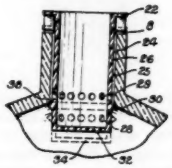


An elastomeric pump comprises a rigid base member and an elastomeric upper member having a dome-shaped part and an elongated lip or flat member extending from a region of the periphery thereof and spaced a small distance above the base. An inlet pipe enters through the base member under the dome and is normally covered by a flat valve. An outlet opening enters under the flat member and is surrounded by an annulus extending into contact with the flat part of the upper member. Pumping is effected by repeated depression of the dome-like part of the upper member. In an alternative drip-free embodiment the elongated lip is secured to the base about its periphery except for its tip which is pre-stressed to abut the base. When the dome is depressed liquid in the pump forces the tip of the lip upward to provide an egress for the liquid along the upper surface of the base.

ERRATUM

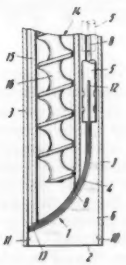
For Class 222—205 see:
Patent No. 3,820,698

3,820,690
CONTAINER AND MEASURING PLUG
Arthur Albert Musher, deceased, late of 805 E. Franklin Ave., Silver Spring, Md. (by Selma Musher, executrix)
Division of Ser. No. 824,128, May 13, 1969. This application Aug. 9, 1971, Ser. No. 112,008
Int. Cl. B65d *25/44*
U.S. Cl. 222—490 **4 Claims**



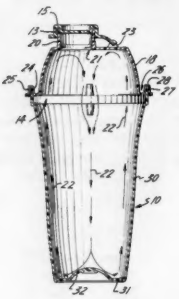
A closure and plug for a container is provided with elements interengaging with other elements on the mouth of the container, to secure it against opening by young children. In one modification, the closure is provided with a combination safety plug and measuring device; the measuring device is provided with a more versatile structure, and a means of accurately varying the measured quantity, the closure is also improved.

3,820,691
IMPROVED OUTLET CLOSURE IN A PACKAGING MACHINE
Walter Saur, Korntal, Germany, assignor to Fr. Hesser Maschinenfabrik AG, Stuttgart-Bad Cannstatt, Germany
Filed Nov. 21, 1972, Ser. No. 308,590
Claims priority, application Germany, Nov. 26, 1971, 2158599
Int. Cl. B65d *47/06*; **B65b** *9/10*
U.S. Cl. 222—560 **7 Claims**



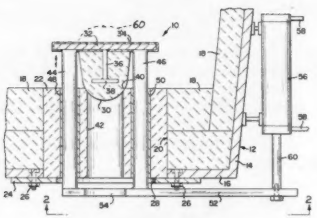
There is disclosed part of a packaging machine for making, filling and sealing webs of tubular packaging material. The machine includes a mandrel and a metering worm. A flexible closure slide movably disposed in the mandrel controls the flow of material through the mandrel.

3,820,692
FOOD SHAKER AND BLENDER
James B. Swett, Barrington, R.I., and Sidney Z. Smith, Worcester, Mass., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 16, 1973, Ser. No. 351,697
Int. Cl. B65d 1/02
U.S. Cl. 222—547 2 Claims



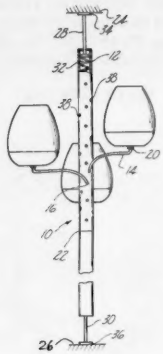
A food storage receptacle or vessel and blender having an overall shape or configuration that is functional to direct fluid flow patterns therein and effect maximum mixing characteristics thereby. In addition to the noted container configuration there is also included therein a removable blending element also of a prescribed configuration that further maximizes fluid mixing action as the receptacle is shaken in use.

3,820,693
BOTTOM POUR APPARATUS FOR A METAL LADLE
John A. Ericson, 732 Market St., Youngstown, Ohio 44502
Filed May 30, 1973, Ser. No. 365,126
Int. Cl. B22d 37/00
U.S. Cl. 222—559 7 Claims



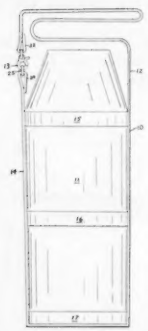
A metal discharge nozzle or control valve assembly for a ladle operatively positioned in the bottom wall of the ladle and including a heat resistant head or stopper for a discharge opening. The discharge nozzle or opening is provided in the valve assembly which is in engagement with the ladle bottom wall, and a heat resistant carrier means for the stopper engages therewith and extends laterally therebeyond which equidistant lateral portions of the carrier means are engaged by a pair of vertically positioned heat resistant support rods that slidably engage the bottom wall of the ladle on diametrically opposed portions thereof in relation to the discharge opening. Heat resistant bushing means are carried by the bottom wall and position the support rods therein and a control member such as a piston and cylinder means are carried on an outside wall of the ladle and operatively engage the support rod means for raising and lowering the carrier and stopper (head) for opening and closing the discharge opening or nozzle.

3,820,694
WIG STAND
Frances E. Pabis, 15423 Kennebec, Southgate, Mich. 48195
Filed Apr. 27, 1973, Ser. No. 355,028
Int. Cl. D06c 15/00
U.S. Cl. 223—66 8 Claims



A display and storage apparatus for wigs and other false hairpieces includes a vertically extensible and adjustable support member having a plurality of apertures disposed therealong. The apparatus further includes at least one support arm. The arm which has one end thereof adapted to be lockingly received within one of the apertures, extends radially outwardly from the support member and has a projection formed at its other end. The projection is snugly nested within projection receiving means formed in the base of a separable hairpiece storage dome.

3,820,695
CONTAINER HARNESS
Edward Pecjak, Box 235, North Kingsville, Ohio 44068
Filed Apr. 3, 1972, Ser. No. 240,449
Int. Cl. A45c 11/20
U.S. Cl. 224—45 AA 1 Claim



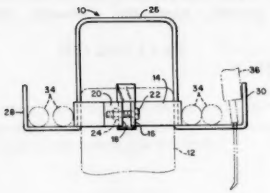
A harness for supporting a container made up of straps generally circular, equal in diameter, and which lie in planes parallel to and spaced from each other. Another strap extends around the circular straps and is attached to diammetrically opposite sides of these straps. A swivel and a ring are attached to the ends of the strap thereby providing a handle for carrying or supporting the container. The straps combine to form a harness which is especially suited for holding a thermos bottle on a door of a truck or the like.

3,820,696

PROTECTIVE CAP FOR A CYLINDRICAL TANK

Adolph Gongolewski, 136 Andrews Rd., Mineola, N.Y. 11501

Filed Jan. 22, 1973, Ser. No. 325,579
Int. Cl. A45c 13/26
U.S. Cl. 224—45 P 2 Claims



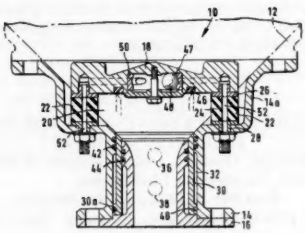
A protective cap having a split band which changes around the cylindrical portion of the tank, and a handle yoke which extends over the top of the tank protecting the valves and providing a handle. Channels are provided around the split band for protecting and storing the hose. A retaining member securably holds the cap in a secure position against a fixed wall.

3,820,697

VALVES WITH VIBRATORY VALVE SEATS

William John Courtney, Trythall, Northumberland, England, assignor to Trythall Design and Development Ltd., Fareham, Hampshire, England

Filed Nov. 10, 1972, Ser. No. 305,561
Claims priority, application Great Britain, Nov. 16, 1971, 53092/71
Int. Cl. B65g 3/12
U.S. Cl. 222—196 4 Claims



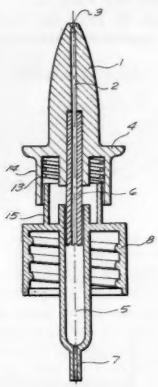
A valve for controlling the flow of fluids, powders, granules and like flowable materials, in which the valve comprises a valve body, a cylindrical valve closure member slidable between a retracted open position and an extended closed position and vibratory means located adjacent an annular inlet aperture of the valve to assist the passage of material through the valve.

3,820,698

DEVICE FOR SPRAYING LIQUID PHARMACEUTICALS

Helmut Franz, Biberach/Riss, Germany, assignor to Boehringer Ingelheim, GmbH, Ingelheim am Rhein, Germany

Filed Aug. 24, 1972, Ser. No. 283,511
Claims priority, application Germany, Aug. 31, 1971, 2143471
Int. Cl. B67d 5/06
U.S. Cl. 222—205 7 Claims



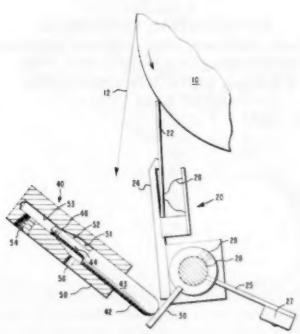
A device for mechanically spraying dosage units of liquid pharmaceutical compositions or solutions thereof onto the skin or into body cavities comprises a manually operated valve of a dosage metering pump and an adapter containing a nozzle.

3,820,699

APPARATUS FOR DETECTING WRAPS ON PROCESSING ROLLS

Braxton Cates Bowen, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 27, 1973, Ser. No. 345,313
Int. Cl. B65h 25/32
U.S. Cl. 226—43 4 Claims



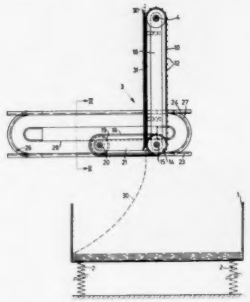
An apparatus for detecting wraps on processing rolls that includes a piston and cylinder assembly connected to a water supply. One end of the piston rests against an extension tab projecting from a deflectable feeler assembly. Formation of a wrap causes the feeler assembly to move away from the roll

surface and the tab away from the piston unseating the piston to cause a sudden drop in water pressure which is sensed by a pressure switch that in turn drops out a relay which stops a motor driving the processing roll. Removal of the wrap permits reseating of the piston.

3,820,700
PAPER STACKER

Marius Quirijnen, Rijswijk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,578
Claims priority, application Netherlands, May 27, 1972, 7207217
Int. Cl. G03b *1/30*
U.S. Cl. 226—74 **1 Claim**

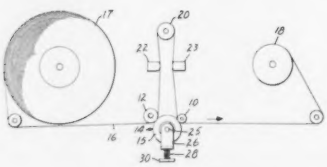


A paper stacker for prefolded paper, comprising a paper collecting device and a paper feed device which is arranged thereabove and which comprises a rigidly arranged drivable first shaft which is coupled to a second shaft which is capable of performing a swinging movement with respect to the first shaft. At least the second shaft is provided with two paper tractors, the second shaft being connected via at least one arm to a third shaft which is coupled to the second shaft and which is provided with at least one gearwheel which can roll down along a toothed rack path which consists of two parallel toothed racks which are connected by two semi-circular gear rings.

3,820,701
DIFFERENTIAL TAPE DRIVE

Kenneth Clunis, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 23, 1973, Ser. No. 353,382
Int. Cl. B65h *17/22*
U.S. Cl. 226—183 **4 Claims**

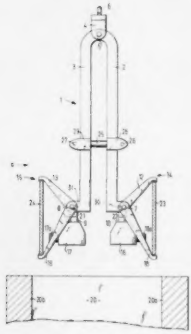


A differential tape drive comprising a hard surfaced capstan, a hard surfaced idler roller having a diameter greater than that of the capstan and a resilient surfaced transfer roller forced into contact with the capstan and the idler roller. The transfer roller is driven by the capstan and drives the idler roller to tension a length of magnetic tape extending from the nip between the idler roller and the transfer roller to the nip between the capstan and the transfer roller.

3,820,702
DEVICE FOR FASTENING INTERMEDIARY PLATES ON A MOLD WALL

Elmar Maier, Feldkirch-Tisis, Austria, assignor to Hilte Aktiengesellshaft, Fuerstentum, Liechtenstein

Filed June 29, 1972, Ser. No. 267,702
Claims priority, application Germany, July 7, 1971, 2133915
Int. Cl. B25c *1/08*
U.S. Cl. 227—9 **12 Claims**



A device for fastening intermediary plates to the wall of mold includes a supporting frame formed of a pair of vertically arranged arms pivotally connected together at their upper ends and a member associated with the arms for moving them away from and toward one another. Located at the lower ends of each arm is at least one setting gun and upper and lower grippers for holding a plate prior to its attachment to the mold by the gun. The setting guns are arranged in pairs with the driving direction of the guns in each pair being disposed 180° apart. A carrier is pivotally attached to the lower end of each of the arms. The guns in each pair are each rigidly attached to a different one of the carriers and the upper gripper is also rigidly attached to the carrier. The lower gripper is arranged for pivotal movement separate from the upper gripper and it is spring biased in the driving direction of the gun mounted on the arm with which it is associated.

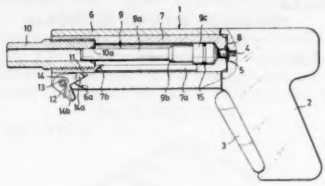
3,820,703
EXPLOSIVE POWDER-DRIVEN TOOL FOR SETTING ANCHORING MEMBERS

Herbert Rangger, Frastanz, Austria, assignor to Hilti Aktiengesellschaft, Fuerstentum, Liechtenstein

Filed Nov. 8, 1972, Ser. No. 304,639
Claims priority, application Germany, Nov. 15, 1971, 2156697
Int. Cl. B25c *1/14*
U.S. Cl. 227—10 **7 Claims**

In an explosive powder-driven tool for setting bolts and the like in a hard receiving material, a barrel is axially displaceable within an opening in the tool housing and a piston is axially displaceable within the bore in the barrel. A slot extending in the axial direction is provided in the barrel and a spring-biased stop member is pivotally mounted in a recess in the housing for displacement into the slot so that the piston can be secured against axial movement relative to the housing while the barrel is moved in the axial direction. The recess also opens to the exterior of the tool housing and the barrel affords a seal for the

recess when the tool is arranged in the firing position. Accordingly, when an anchoring member is fired from the tool,

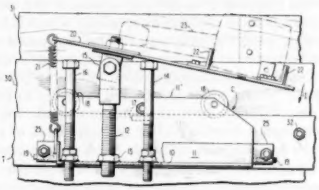


any gases developed which pass from the barrel into the recess containing the stop member will flow out of the tool because the recess is open to the exterior of the tool.

3,820,704
APPARATUS FOR FABRICATING A STRUCTURAL FRAME IN HORIZONTAL POSITION

James M. Stanley, Vicksburg, Miss., assignor to Multi-Systems, Inc., Vicksburg, Miss.

Filed Dec. 22, 1972, Ser. No. 317,605
Int. Cl. B27f *7/02*
U.S. Cl. 227—110 **5 Claims**



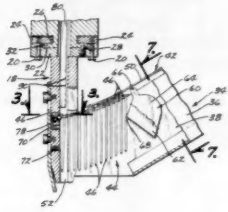
This invention relates to a nailing machine carriage assembly guidably supported on a vertical track attached to and running the length of a framing table used for making wall frames and the like. The carriage comprises a carriage base, which may form a tray, and a nailer support plate positioned above and supported by the carriage base, means for altering the vertical placement of an automatic nailing device pivotably positioned on the nailer support plate, and a plurality of rollers preferably grooved, rotatably attached to the carriage base and designed to contact the vertical track running the length of the framing table. The carriage is in cantilevered relationship with the track and further includes stabilizing means, e.g., rollers positioned on opposite sides of the track, to effect a torque counter to the torque normally present. This carriage and track system has a particular advantage in that because of the vertical track construction workers are able to get closer to the working surface of the framing table than they can with conventional horizontal track systems.

3,820,705
NAILING MACHINE

Wayne D. Beals, 2351 E. 40th & Ct., Des Moines, Iowa 50317

Filed Aug. 7, 1972, Ser. No. 278,605
Int. Cl. B25c *1/04*
U.S. Cl. 227—113 **18 Claims**

A driving pin is positioned in the bore of a barrel and a pneumatic power means reciprocates the driving pin against nail heads fed into the bore from a guide extending at an angle to the bore upwardly and outwardly. A ball detent stop means is provided in the wall of the bore opposite the guide to engage the lower side of the nail head and a pair of magnets is positioned with opposite poles adjacent the nail shank to maintain the shank in the bore. The driving pin includes at least one transversely extending groove providing a shoulder which engages the head of the nail when the driving pin is retracted thereby pivoting the nail such that the shank moves into the field of magnets and is held there until it is driven by the driving pin. The nails are fed from the guide into the bore by gravity and a weight is positioned in the guide to engage the nails and maintain them in contiguous relationship. The weight is U-shaped and the bight portion straddles a wall of the guide and if the guide is positioned to extend downwardly the weight pivots in such a manner that the bight portion wedges against

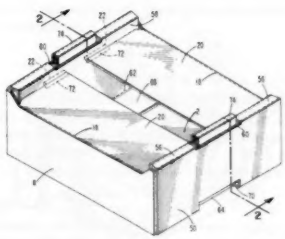


the top edge of the wall and the cover plate preventing the nails from moving in the guide away from the bore. The driving pin is circular in cross section but is flattened along the side having the transverse groove and the lower end is tapered downwardly and inwardly to facilitate contact with the nail head in the bore only since the nails in the guide have their heads in overlapping relationship. The barrel on the head of the nailing machine is rotatable to maintain the guide in an upwardly extending position when the gun is being used to nail at various angles.

3,820,706
FIBERBOARD CONTAINER

Ronald L. Gibson, and Charles L. Watkins, both of Olympia, Wash., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Jan. 26, 1973, Ser. No. 326,791
Int. Cl. B65d *5/22, 21/02*
U.S. Cl. 229—34 R **10 Claims**

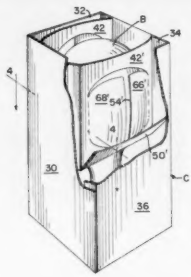


A fiberboard shipping container assembled from a single cut and scored fiberboard blank for containing goods, such as produce. The container includes end walls formed by multiple fiberboard thickness and having stacking tabs projecting upwardly from the upper edges thereof and notches in the lower edges thereof for receiving the stacking tabs of a subjacent container to facilitate stacking of the containers. The container also includes cover flaps which may extend less than all the way across the top of the container to permit cooling air to circulate about the contents of the container.

3,820,707
LIGHT BULB PACKAGE

Edward Fischer, Dumont, and Edwin L. Arneson, Hillsdale, both of N.J., assignors to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Dec. 5, 1972, Ser. No. 312,362
Int. Cl. B65d 5/02
U.S. Cl. 229—39 B 6 Claims

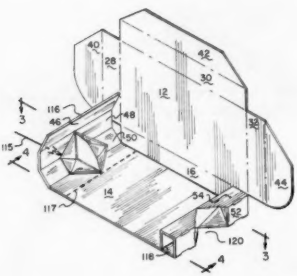


A package for an electric light bulb or similar article which comprises a collapsible open-ended tubular carton of square cross section and formed of paperboard or similar sheet material having a foldable internal partition structure in one end thereof which is characterized by a pair of parallel wall panels spaced inwardly from oppositely disposed side walls of the carton and having pairs of hinged panels cut therein which resiliently grip the body portion of a light bulb when it is positioned between the inner wall panels with portions thereof seated in the openings which result from cutting the hinged body gripping panels therein.

3,820,708
SHIPPING CONTAINER

William G. Sieffert, Joliet, Ill., assignor to Olinkraft, Inc., West Monroe, La.

Filed Sept. 20, 1972, Ser. No. 290,725
Int. Cl. B65d 5/02, 85/30
U.S. Cl. 229—40 10 Claims

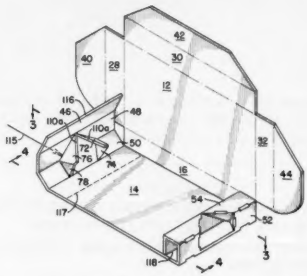


An improved shipping container for a book or the like having an improved end cell cushioning structure that is formed in part from the bottom panel of the container and in part from two of the three cushioning panels hingedly attached to the bottom panel. The new and improved shipping container is formed out of a single piece of paperboard having a minimal size and, due to its unique construction, it may be easily formed around the book or the like object to be packaged within the container on book folding machines of the type well known in the art.

3,820,709
SHIPPING CONTAINER

William G. Sieffert, Joliet, Ill., assignor to Olinkraft, Inc., West Monroe, La.

Filed July 16, 1973, Ser. No. 379,548
Int. Cl. B65d 5/02, 85/30
U.S. Cl. 229—40 14 Claims

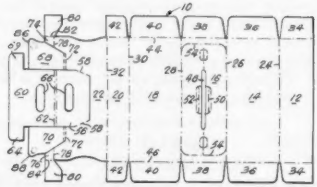


An improved shipping container for a book or the like having an improved end cell cushioning structure which is formed from cushioning panels attached to the bottom panel of the container and adapted to be folded into a square or rectangular cellular cushion. Additionally, the cushioning panels include triangular panels which are folded inwardly to provide rigidity to the cellular cushion. The new and improved shipping container is formed out of a single piece of paperboard having a minimal size and, due to its unique construction, it may be easily formed around the book or similar object to be packaged within the container on book folding machines of the type well known in the art.

3,820,710
BREAK-AWAY HANDLE

Norman E. Burgess, Westmount, and Robert E. Flynn, Mascouche, Quebec, both of Canada, assignors to Domtar Limited, West Montreal, Canada

Filed Sept. 18, 1972, Ser. No. 290,251
Int. Cl. B65d 5/46, 25/28
U.S. Cl. 229—52 B 7 Claims



A one piece carton is described having a central divider with a handle formed of two foldably interconnected parts. The handle is detachably connected to the partition by frangible lines of weakness and is retained in position by a pair of flaps integrally, foldably connected to the partition and overlying lateral flanges of the handle to trap the handle between the flaps and the partition.

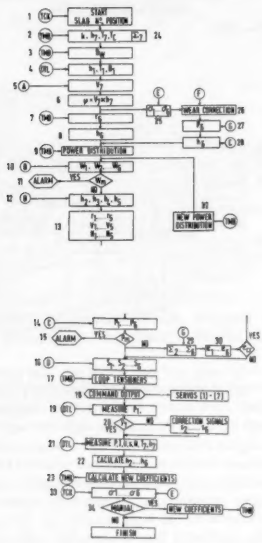
3,820,711
PROCESS FOR THE PREDETERMINATION OF THE DATUM VALUES OF A WIDE-STRIP-FINISHING ROLLING MILL TRAIN CONTROLLED BY AN ELECTRONIC CALCULATOR

Mario Economopoulos, 58-Quai de Rome, and Stephan Hubert Wilmotte, 2 Rue de Chaudfontaine, both of Liege, Belgium

Continuation-in-part of Ser. No. 115,647, Feb. 16, 1971, abandoned. This application May 1, 1973, Ser. No. 356,130

Int. Cl. B21b *37/00*

U.S. Cl. 235—151.1 **3 Claims**



A number of improvements are provided in the process of determining the datum values of the rolling mill train. The curvatures of the rolls are continuously determined during the milling run, to take into account wear and thermal expansion. The force to be applied at the final roll-stand to obtain the required strip profile is determined. The power of the rolling mill is distributed between the stands in such a manner that the strip remains plane.

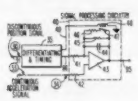
3,820,712
ELECTRONIC TACHOMETER

Richard Karl Oswald, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,629

Int. Cl. G01p *7/00*; **G06g** *7/18*

U.S. Cl. 235—151.32 **10 Claims**



An electronic tachometer for generating a continuous velocity output signal from the combination of a discontinuous position signal and a continuous acceleration signal is disclosed. The tachometer comprises a differentiating and timing means for receiving the discontinuous position signal and for developing and generating timing signals and a differentiated discontinuous position signal therefrom, and also signal processing circuitry for receiving and combining the differentiated discontinuous position signal and the timing signals and the continuous acceleration signal to form the continuous velocity output signal. The timing signals change the transfer function of the signal processing circuitry at specific times with relationship to the differentiated discontinuous position signal.

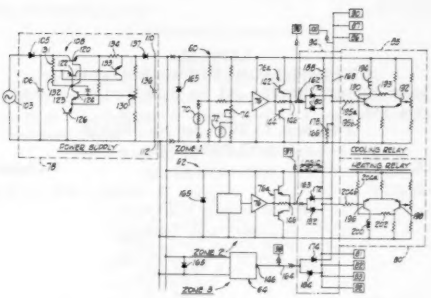
3,820,713
MULTIPLE ZONE AIR CONDITIONING SYSTEM

Merlin E. Demaray, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Division of Ser. No. 203,329, Nov. 30, 1971. This application June 8, 1973, Ser. No. 368,221

Int. Cl. F24d *5/00*; **F24f** *11/08*

U.S. Cl. 236—1 E **8 Claims**



A multiple zone air conditioning system is disclosed having a control system in which heating or cooling equipment is controlled according to the maximum and minimum zone air conditioning loads. The control system is constructed using electronic components which are protected against damage due to improper installation.

3,820,714
WATER JET PROJECTOR AND CONTROL APPARATUS

Lennart G. Erickson, 2075 Pioneer Ct., San Mateo, Calif. 94402, and William S. Erickson, 260 Casitas Bulevar, Los Gatos, Calif. 95030

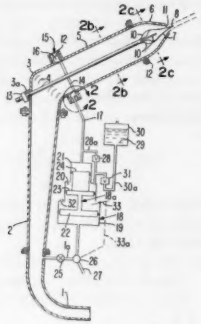
Filed Oct. 6, 1972, Ser. No. 295,763

Int. Cl. B05b *3/04*

U.S. Cl. 239—10 **65 Claims**

Apparatus for receiving a flow of water under pressure and for projecting the water through the air in the form of a jet having improved uniformity of cross section, power concentration and range of projection. Means is provided for manually or automatically rotating the apparatus to permit horizontal, full-circle, angular projection of the water jet and for optionally adjusting the vertical elevation of the water jet trajectory. The range of water jet projection may be lengthened by injection of a friction-reducing chemical fluid to the water flow through the apparatus or may be shortened by selectively placing a mechanical deflection means at least partially across the water jet issuing from the apparatus. Automatic timer sequence means is optionally used to cyclically change the range of projection and the rate of rotation of the apparatus to achieve sequential irrigation of two or more areas

of land within the range of coverage of the water jet and to permit uniform irrigation of relatively rectangular land areas.



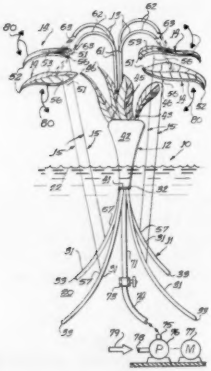
Means responsive to wind pressure and direction is provided to control power concentration and the arc of trajectory of the water jet.

3,820,715

ORNAMENTAL RHYTHMIC FOUNTAIN

Charles Edward Hamilton, Rt. No. 5 18 West Ave., Arcadia, Fla. 33821

Filed Sept. 13, 1973, Ser. No. 397,075
Int. Cl. B05b *17/08*
U.S. Cl. 239—17 **4 Claims**



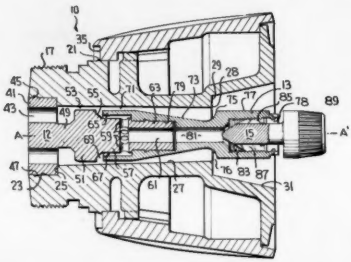
An ornamental fountain intended for small garden ponds around a home or in office lobbies and apartment entrances in which a water retaining basin is provided having a decorative center piece with ornamental foliage projecting upwardly therefrom and supported on a framework on the bottom surface of the basin, and a plurality of leaf like members disposed above the center piece at different points about a circle defined thereabove and extending radially outwardly from the center of the circle, each of the leaf members supported on a flexible thin rod extending downwardly and inwardly therefrom to be attached at positions on the supporting frame beneath the normal level of the water in the basin, and a water supply tube having one end disposed in the container from whence it branches into a plurality of inverted J-shaped tubes each extending longitudinally out of the container and having their respective outlet portions each associated with a particular leaf member in a manner to discharge water onto the leaf members, the force of the water impinging on the leaf members effecting the rhythmic rocking motion thereof back and forth in the general plane defined by the direction of the water discharged thereonto thus providing a pleasing rhythmic effect, with the water supply tube connected in a suitable manner to a water pump and motor for constantly circulating the water from the basin up through the tube and onto the leaf from whence it falls back into the basin to again be circulated.

3,820,716

FLUIDIC OSCILLATOR FOR PROVIDING DYNAMIC LIQUID SPRAY PATTERNS

Peter Bauer, Germantown, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.

Filed Jan. 11, 1973, Ser. No. 322,608
Int. Cl. B05b *3/14*
U.S. Cl. 239—102 **36 Claims**



A fluidic oscillator is capable of alternating between full and partial channel flow states. In the partial channel flow state a relatively high velocity jet flows straight through the oscillator interaction region and issues through a single outlet opening in a predetermined direction. In the full channel flow state a diffused output flow fills the interaction region and issues from the same outlet opening at a considerably slower velocity and at an angle relative to the high velocity jet. In a preferred embodiment the oscillator has an annular transverse cross-section which surrounds a central longitudinal feedback passage. A straight cylindrical outer sidewall of the interaction region extends adjacent the high velocity jet, which issues when ambient air enters the feedback passage. Part of the high velocity jet is fed back into the interaction region to reduce the pressure therein and initiate full channel flow. The inner interaction region sidewall has a semi-teardrop configured longitudinal cross-section and combines with the outer sidewall to direct the full channel flow away from the feedback passage, permitting ambient air to re-enter the interaction region and re-initiate the partial channel flow state. The resulting spray of flow pattern alternately widens and narrows and is suitable for shower heads, sink sprays, decorative fountains, etc. In one embodiment an adjustment is provided to block ambient air from the interaction region to permit a steady, unaerated, full-channel outflow.

3,820,717

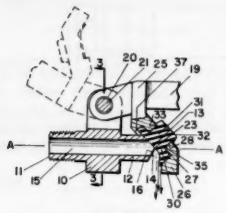
FLUSHABLE NOZZLE HAVING MEANS FOR REDIRECTING AND DISPERSING THE EFFLUENT

Werner P. Pohle, Lynn, Mass., assignor to Spray Engineering Company, Burlington, Mass.

Filed Mar. 5, 1973, Ser. No. 337,834
Int. Cl. B05b *15/02*
U.S. Cl. 239—107 **7 Claims**

A spray nozzle characterized by a body portion on which one end of a shank is pivotally mounted for swinging movement toward and away from a position in which a resilient member carried by an arm depending from the shank is in sealing engagement with one face of an egress port comprising the two faces of a dihedral angle intersected by a flow passage extending through the body. When the shank is swung away

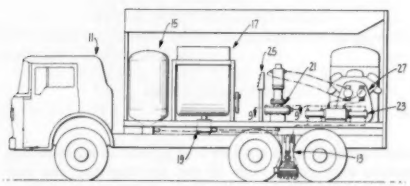
from the position stated, both faces of the dihedral angle are exposed, thereby permitting the flushing from the egress port of any material which may be clogging it when said one of the angle faces is engaged with and sealed off by the resilient member.



3,820,718
TRAFFIC MARKING SYSTEM

Harry C. Ammon, Sacramento, Calif., assignor to State of California Department of Public Works Division of Highways

Filed Dec. 20, 1972, Ser. No. 316,757
Int. Cl. B05b *1/24, 1/28;* **F22b** *3/06*
U.S. Cl. 239—135 **9 Claims**



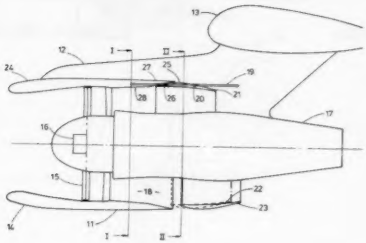
A traffic marking system is provided wherein a material is applied in a heated condition to a roadway, the heat being developed by a novel system of agitation. The invention permits a plurality of layers of material to be applied in a single pass. The invention also provides for imbedding reflective beads in the material.

3,820,719
GAS TURBINE ENGINES

Kenneth William Clark, Bristol, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Apr. 30, 1973, Ser. No. 355,425
Claims priority, application Great Britain, May 9, 1972, 21659/72
Int. Cl. F02k *3/04*
U.S. Cl. 239—265.31 **8 Claims**

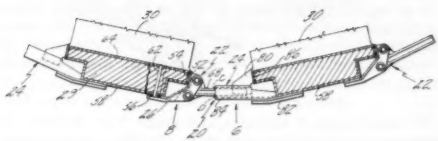
A fan type gas turbine engine for use in an aircraft, the engine having a fan cowl comprising at least two annular parts, one part being axially separable from the remainder of the fan cowl to provide an annular opening giving additional nozzle area during take-off conditions and being shaped to promote attachment of the extra nozzle flow to its outer surface; and, if the fan is a variable pitch fan, the additional nozzle area can serve as additional intake area for the fan during operation in the reverse pitch mode.



3,820,720
FLAP SYNCHRONIZING CONTROL MEANS

Larry E. Anders, Palm Springs, and Joel F. Sutton, Lake Park, both of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 29, 1973, Ser. No. 392,834
Int. Cl. B64c *15/08*
U.S. Cl. 239—265.39 **9 Claims**



A nozzle arrangement is shown having an actuation device at the rear end of flaps which are pivoted intermediate their ends thereof and synchronizing means adjacent the forward ends of the pivoted flaps. The actuating means are shown in detail in U.S. Pat. No. 3,730,436 and the forward synchronizing means comprises engaging male and female members which maintain the nozzle in "round" and are located forward of the pivot point of the flaps so that the male and female members will have their maximum engagement and therefore maximum rigidity at the maximum throat area of the nozzle, said throat area being directly proportional to the position of the rear ends of the flaps.

This invention herein described was made in the course of or under a contract with the Department of the Air Force.

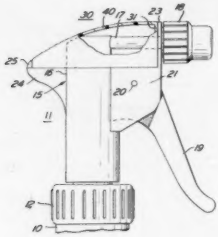
3,820,721
HAND OPERATED SPRAYER WITH ATTACHED HEAD

Johann F. Hellenkamp, 4706 S.W. 75th Ave., Miami, Fla. 33155

Filed May 21, 1973, Ser. No. 362,241
Int. Cl. B05b *1/28*
U.S. Cl. 239—288.5 **8 Claims**

A separate head is provided attachably carried on a hand operated sprayer for purposes of identification of the contents

or the manufacturer, the head being restrained from a longitudinal horizontal movement at its ends, restrained at its center

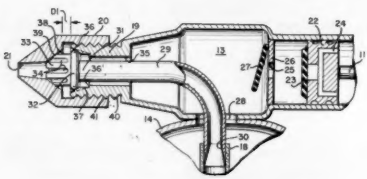


against longitudinal and transverse horizontal movement and resiliently clamped at one end.

3,820,722
AGGREGATE SPRAY GUN

Howard V. Jett, 238 Los Angeles Ave., Moorpark, Calif. 93021, and Joseph V. DeMarco, 165 W. Ripley St., Tarzana, Calif. 93010

Continuation-in-part of Ser. No. 254,899, May 19, 1972. This application July 25, 1973, Ser. No. 382,542
Int. Cl. B05b *7/24*
U.S. Cl. 239—373 **5 Claims**



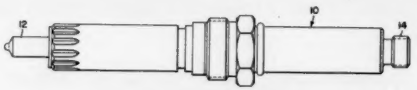
A nozzle support structure and nozzle held thereby are designed for cooperation with an air chamber receiving pressurized air and a delivery tube from a container of an aggregate spray composition. The delivery tube extends into the support structure past the exit end opening of a reduced diameter passage and terminates in a free end spaced from the outlet orifice of the nozzle. A portion of this free end includes an external O-ring which blocks backward movement of the delivery tube when the O-ring engages the exit end opening of the reduced diameter passage. The orifice of the nozzle is tapered and includes an entrance portion which limits the degree of forward movement of the delivery tube in the support structure and by making the position of the nozzle longitudinally adjustable on the support structure the distance between the exit end opening of the reduced diameter passage and the entrance portion of the nozzle orifice can be varied thereby limiting the amount of air that can bypass about the O-ring and mix with aggregate spray composition so that the splatter pattern of the spray can be controlled.

3,820,723
FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINE AND THE LIKE

John Henry Shipinski, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 21, 1973, Ser. No. 343,225
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 **9 Claims**

A fuel injection nozzle of the type in which the needle valve and spring are eccentric and there is interposed between the needle valve and spring a low-mass hollow member having excellent bearing relation to the spring bore so as to prevent

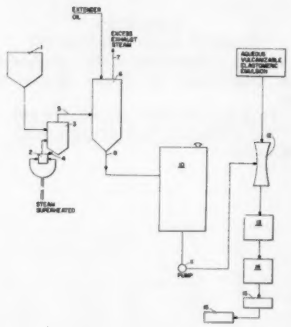


cocking and to enable the use of a spring of maximum diameter consistent with the diameter of the spring bore and the size of the needle valve.

3,820,724
USING GROUND CARBON IN OIL PHASE MASTERBATCHING

William W. Gotshall, Orchard Lake, Mich., assignor to Marathon Oil Company, Findley, Ohio

Division of Ser. No. 22,646, March 25, 1970, Pat. No. 3,640,940. This application Dec. 23, 1971, Ser. No. 211,672
Int. Cl. B02c *21/00*
U.S. Cl. 241—39 **2 Claims**

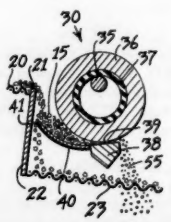


Ground carbons from coke or coal ground in nonoxidizing atmosphere and coated with oil can be dispersed and protected from oxidation by mixing them directly into oil phase masterbatches.

3,820,725
RING SCREEN CRUSHER

Nelson H. Bogie, Rt. 1, Gilbertsville, Ky. 42044

Filed Aug. 30, 1973, Ser. No. 393,002
Int. Cl. B02c *23/02, 25/00*
U.S. Cl. 241—76 **8 Claims**



A ring crusher including a plurality of crushing rings supported upon a transverse shaft fixed to a vibrating screen

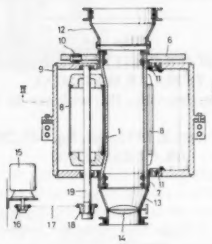
frame and adapted to crush solid material between the ring and an anvil bar fixed to the frame beneath the rings. An upwardly inclined anvil skirt is fixed adjacent the front edge of the anvil bar to support a reserve of uncrushed material adjacent the anvil bar. The anvil skirt terminates in a front lip over which excess uncrushed material falls.

3,820,726

APPARATUS FOR ABRADING AND REFINING FOUNDRY

Kaoru Takechi, Osaka; Shoji Yamada, and Chiaki Ishiguro, both of Inuyanashi, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyotoshi, Japan

Filed Aug. 9, 1972, Ser. No. 279,180
Int. Cl. B02c *17/04*
U.S. Cl. 241—102 **10 Claims**



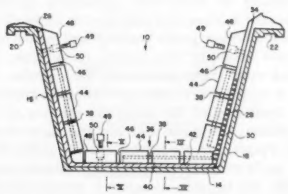
An apparatus for abrading and refining foundry sands comprising a sealed vessel which is made from flexible material and means for pressing the vessel successively and continuously.

3,820,727

LINER FOR GRINDING MILLS

Robert Jackson Russell, York, Pa., assignor to Koppers Company Inc., Pittsburgh, Pa.

Filed Nov. 10, 1972, Ser. No. 305,435
Int. Cl. B02c *17/22*
U.S. Cl. 241—183 **4 Claims**



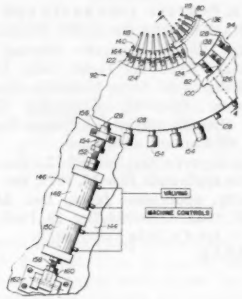
A grinding mill having an inner liner assembly which comprises a plurality of spaced guide members secured to the inner peripheral surface of the grinding mill thus forming rows of guide members extending longitudinally of the axis of rotation of the grinding mill; a liner member disposed between each row of guide members forming liner rows adjacent to and along the length of the guide members; lifter members coincident with the guide members and slidably engaged therewith along the length of the guide members to substantially overlie and edge portion of the adjacent liner rows thus forming rows of lifter members alternately disposed with the liner rows; and key lifter members secured to the inner surface of the grinding mill to maintain the alternate rows of the lifter members and the liner members in their respective positions.

3,820,728

STATOR WINDING METHOD AND APPARATUS

Bruce R. Pitt, Wauwatosa, and John W. Wolf, Colgate, both of Wis., assignors to The Globe Tool and Engineering Company, Dayton, Ohio

Filed Apr. 30, 1971, Ser. No. 139,055
Int. Cl. H02k *15/085*
U.S. Cl. 242—1.1 R **4 Claims**



Some coils wound in a stator core are wound directly into the bottoms of the stator slots. Coils overlapping those wound in the bottoms of the slots are urged radially outwardly toward the bottoms of the slots after the winding thereof.

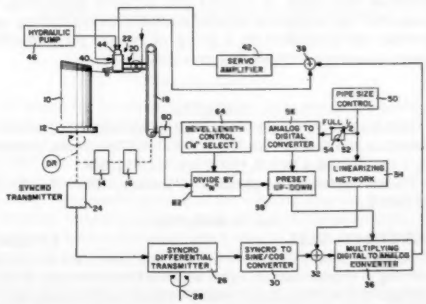
Wire guide fingers are mounted for radial movement and spring biased to outer positions at which they guide the wires into the bottoms of stator clots. The fingers are driven radially inwardly when coils other than those in the bottoms of the slots are being wound, the drive being disengaged after the winding of each of the last mentioned coils whereupon the fingers are biased back toward their outer positions. If, as common, there are three groups of coils, the first group is wound directly into the bottoms of the slots, the second group is wound with the fingers displaced radially inwardly through a first increment, and, after the winding of each of the coils of the second group, the fingers are biased toward the bottoms of the slots. The fingers are displaced a greater increment radially inwardly when winding coils of the third group.

3,820,729

METHOD AND APPARATUS FOR CONTROLLING BEVEL WRAPPING MECHANISM

Lamar D. Springer, Spring Valley; David L. Mullendore, and Alfred L. Marcum, Jr., both of Centerville, all of Ohio, assignors to Price Brothers Company, Dayton, Ohio

Filed Oct. 30, 1972, Ser. No. 294,516
Int. Cl. B21f *17/00*; **B65h** *81/06*
U.S. Cl. 242—7.21 **8 Claims**



Apparatus for electronically monitoring the rotational position of a concrete core as it is rotated about its axis during a

prestressing wire wrapping operation and simultaneous monitoring the position of a wire feed carriage moving axially of the pipe to provide signals for controlling the movement of a pantograph type wire guide which oscillates the wire guide with a straight line movement parallel to the axis of the core as the wire feed carriage moves along the bevel end of the core.

3,820,730

AUTOMATIC DOFFING APPARATUS FOR TEXTILE MACHINE HAVING ONE OR MORE WINDING UNITS

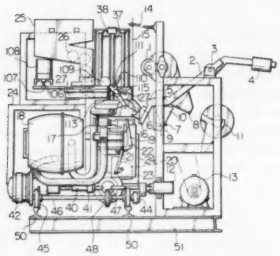
Tetsuhiko Endo, 52 Yonchono-cho Misasagi Yamashina, Migashiyama-ken Kyoto-shi; Toshio Aoba, 121 Sengendai Nishi-ku, Yokohama-shi; Shozo Morishita, Mangaku-Ryo 3-1-3 Sonayama, Otsu-shi; Katsusuke Egami, 6-28 Kojyogaoka, Otsu-shi Shiya, and Shingo Hagihara, 2-28 Bunkyo-cho, Mishima-shi, all of Japan

Continuation-in-part of Ser. No. 885,174, Dec. 15, 1969, abandoned. This application June 12, 1972, Ser. No. 261,638

Claims priority, application Japan, Dec. 24, 1968, 43-112903; Dec. 27, 1968, 43-96004; Dec. 28, 1968, 43-371

Int. Cl. B65h *54/20, 54/26*

U.S. Cl. 242—35.5 R **13 Claims**



A textile machine having a plurality of winding units arranged in a row is serviced by automatic doffing apparatus travelling on a track along the row of winding units. Each winding unit has means for sensing when a bobbin being wound in it is full. When the doffing apparatus comes to a winding unit with a full bobbin, it stops, the yarn is severed upstream of the bobbin and is sucked into a storage box and the full bobbin is released from the bobbin chuck and discharged. A new bare bobbin is thereupon delivered by the doffing apparatus to the chuck, the yarn is transferred to the new bobbin which thereupon starts to rotate and is severed by the severing means downstream of the bobbin. The doffing apparatus then proceeds to the next winding unit with a full bobbin. When stopping at a winding unit, the doffing apparatus first slows down so that shock is avoided and accurate positioning is achieved. The sequential steps of operation of the doffing apparatus are controlled by a group of coaxial programming cams actuating corresponding microswitches.

3,820,731

THREAD SUPPLY DEVICE FOR TEXTILE MACHINES

Karl Isac Joel Rosen, Villa Haga, S-52300 Ulricehamn, Sweden

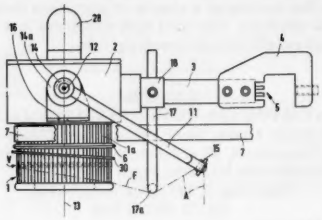
Filed Dec. 4, 1972, Ser. No. 312,048

Claims priority, application Germany, Dec. 3, 1971, 2160161

Int. Cl. B65h *51/20*

U.S. Cl. 242—47.12 **13 Claims**

A thread supply device for a textile machine, said device including a rotatable drum upon which a thread issuing from a storage coil is tangentially wound to form on the drum an intermediate thread storage. A thread guide element is positioned adjacent the drum for guiding the thread as unwound from the intermediate storage. The thread guide element is movably mounted transversely relative to the direction of the thread passing therethrough and is resiliently biased in said



transverse direction such that the thread is resiliently deflected in the lateral direction to form a compensation loop.

3,820,732

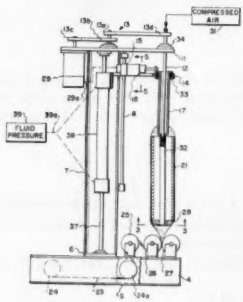
APPARATUS FOR RADIALLY WINDING FLEXIBLE TUBULAR MATERIAL

Frank M. McNeill, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Filed Apr. 2, 1973, Ser. No. 347,292

Int. Cl. B65h *17/02*

U.S. Cl. 242—55 **10 Claims**



An apparatus for winding a flexible thin-walled tubular material, radially of itself into a plurality of overlapping reverse pleats for storage and subsequent unwinding or feeding comprises: a hollow guide member and means for supporting the guide member for rotary movement, a support member, and means for supporting the member for rotary movement, a supporting means permitting longitudinal movement of at least one of the members relative to the other, means for rotating the guide member and support member in opposite directions, and means for moving either the support member or guide member or both longitudinally and reciprocally whereby the support member is reciprocated into and out of the guide member. When flexible tubular material is passed over the guide member and secured to the support member, the rotary and reciprocal movements of the members are effective to cause the tubular material fed thereover to be wound in a plurality of overlapping reverse pleats.

3,820,733

SPOOLED WIRE REEL AND HANDLING DEVICE THEREFOR

Willis A. Roederer, P.O. Box 187209 Watson Ave., Byesville, Ohio 43723

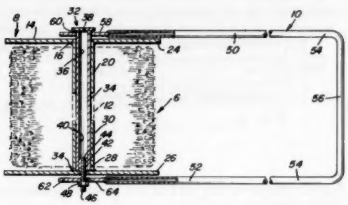
Filed Dec. 27, 1972, Ser. No. 319,009

Int. Cl. B65h *75/40*

U.S. Cl. 242—94 **2 Claims**

A knockdown-type reel for use when unwinding and paying out fence wire from a spool of barbed wire comprising first

and second disk-type reel heads which are centrally apertured and have opposed inwardly disposed oriented faces, each inward face having an elongated tubular or sleeve-like bushing. These bushings are alike in construction, are alignable with each other and the bores thereof provide coordinating bearings. An assembling axle can be inserted and passed through the respective bearings, the end portions of said axle



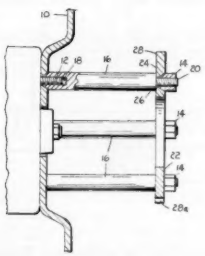
being capable of cooperatively uniting the two heads. The heads are capable of serving as wheels and can be rolled along the surface of the ground adjacent to the fence posts on which the unwound wire is adapted to be stapled. The end portions of the axle are constructed to not only assemble the two heads but to rotatably mount the overall reel on adapter brackets carried by the legs of a push-pull type handling and maneuvering frame.

3,820,734

REMOVABLE WINCH DRUM FOR VEHICLE WHEEL

Gary M. Selliken, 4810 S.W. Fairhaven St., Portland, Oreg. 97221

Filed Aug. 6, 1973, Ser. No. 385,886
Int. Cl. B65h *17/46*
U.S. Cl. 242—95 **3 Claims**



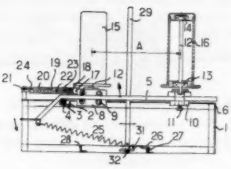
A plurality of posts have a threaded opening on one end adapted to threadedly engage vehicle wheel lugs or studs which normally receive the lug nuts. These posts have integral studs on their other ends for projection through an annular plate member and for receiving attaching nuts which secure the plate member on the posts. The projecting portions of the posts are threaded and of a size to receive the lug nuts so that the latter can be used to hold the plate member on the posts, thus forming a winch drum which can be used by the vehicle to pull itself out of trouble.

3,820,735

HANK CARRIERS

Edouard Raymond Six, Residence Trianon 26 Ave. G. Delory, 59 Roubai, France

Filed Sept. 22, 1972, Ser. No. 291,407
Claims priority, application Belgium, Oct. 19, 1971, 51388
Int. Cl. B65h *75/24*
U.S. Cl. 242—110 **10 Claims**



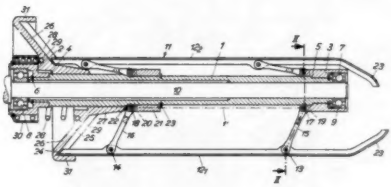
A hank carrier and stretching device comprises two drums around which the hank is to be wound and additionally stretched by movement apart of the drums. The invention provides automatic means reducing the spacing between the drums when they are brought into a raised position for loading and unloading and when lowered to a working position the drums are automatically tension apart. The device comprises a frame and pivotable carrier supporting the drums, there being means connected between the frame and a drum slidable on the carrier to effect the automatic tensioning and relaxation of the spacing between the drums as the carrier is pivoted between a vertical loading and unloading position and a horizontal working position.

3,820,736

DEVICE FOR UNWINDING THREAD WINDINGS

Wilhelm Moor, Emmenbrucke, Switzerland, assignor to Industrie A.G. Allegro, Emmenbrucke, Switzerland

Filed Feb. 15, 1972, Ser. No. 226,601
Claims priority, application Switzerland, Feb. 18, 1971, 2346/71
Int. Cl. B65h *75/24*
U.S. Cl. 242—110.2 **5 Claims**

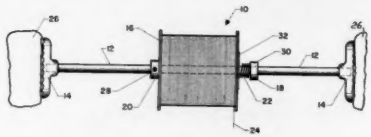


A device for unwinding thread windings which are axially slipped on a winding support whose diameter is variable and is mounted on a rotatably mounted shaft carrying at one end a slidable cone engaging heads on one end of a plurality of legs which extend parallel to the axis of the rotatable shaft and are forming the expandable body of the winding support. Each leg is pivotally connected adjacent its ends with the outer ends of two parallel arms, the other inner ends of which are pivotally connected to collars on the rotatable shaft. A spring urges the slidable cone in a direction in which it engages the heads on the legs and moves the same outwardly together with the legs to the desired diameter so as to frictionally engage and grip the inner cylindrical surface of the thread winding to be unwound.

3,820,737
SPOOL HOLDER-LINE SERVER

Gerard V. Hults, 4508 W. Park Rd., Hollywood, Fla. 33021

Filed Sept. 5, 1972, Ser. No. 286,347
Int. Cl. B65h *49/00*; D01h *7/16*
U.S. Cl. 242—129.5 1 Claim

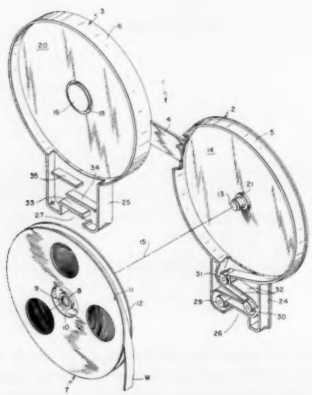


A spool holder-line server adapted to be held between the legs of a user which provides for the paying out of a line under tension to allow the free usage of the hand of a user while serving or transferring a line from the spool to a second spool or a reel. The holder consists of a shaft having resilient end means which may be held firmly between the legs of the user, a spool rotatably mounted near the center of the shaft, shaft collars placed adjacent to the spool on the shaft and a spring means adjacent to one side of the spool which would provide continuous drag on the rotational motion of the spool thereby tensioning the line as it is withdrawn.

3,820,738
MAGAZINE FOR A REEL

Wayne I. Collins, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 18, 1973, Ser. No. 361,759
Int. Cl. G03b *1/04*; G11b *15/32*, *23/04*
U.S. Cl. 242—197 10 Claims

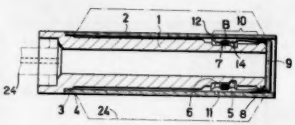


A magazine, adapted to hold a reel or the like on which a web material can be stored in roll form, has a housing comprising two separable housing portions for receiving the reel therebetween. One of the housing portions includes a spindle or other device for mounting the reel for rotation within the magazine. The other of the housing portions includes a friction member, such as a compressible pad, which is supported for rotation in firm contact with a reel rotatably mounted in the magazine. Rotation of the friction member manually or otherwise, results in rotation of the mounted reel.

3,820,739
APPARATUS FOR HOLDING AND CENTERING A TUBE ON A BOBBIN HOLDER

Felix Graf, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Feb. 23, 1972, Ser. No. 228,711
Claims priority, application Switzerland, Feb. 27, 1971, 2872/71
Int. Cl. B65h *54/54*
U.S. Cl. 242—46.4 16 Claims

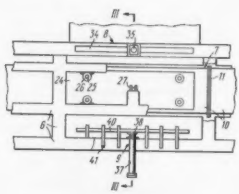


A cap is mounted over the end of the bobbin holder and includes resilient lappets or fingers which are adapted to pass over a rubber ring and be deflected outwardly to frictionally engage the tube. The cap is constructed to roll the rubber ring from an inoperative position within a groove to an operative position in which the ring is resiliently deformed under stress between the cap fingers and bobbin holder.

3,820,740
PLANT FOR PNEUMATIC TRANSPORTATION OF GOODS IN CONTAINERS ALONG A TUBE

Adolf Moritsovich Alexandrov, Federativny prospekt 6, korpus 3, kv. 8; Vladimir Efimovich Aglitsky, Zatsepsky val 6/13. kv. 61; Jury Abramovich Tsimbler, Sojuzny prospekt 10, kv. 261; Jury Arnoldovich Topolyansky, Matveeskaya ulitsa 10, Korpus 4, kv. 233; Ilya Solomonovich Kantor, Malo-Moskovskaya ulitsa 31, kv. 45; Viktor Semenovich Maslov, Leningradskoeshosse, 128, korpus 3, kv. 75, all of Moscow, and Gennady Mikhailovich Alexeev, Sredny prospekt, 61, kv. 55, Leningrad, all of U.S.S.R.

Filed June 20, 1973, Ser. No. 371,693
Int. Cl. B65g *51/04*
U.S. Cl. 243—19 5 Claims



The plant has a loading/-unloading station including a chamber which is a section of a tube, and a charging/delivery device and a lifting device mounted at the opposite sides of this chamber.

The chamber has two opposing ports of which one is intended for passage of the goods therethrough and the other is an additional port for passage into this chamber of the movable member of the lifting device. The two ports are closable with respective lids to render the chamber air-tight during transportation of the containers.

The chamber is mounted for rotation about the geometric axis thereof, for the goods passage thereof to register with the port of a charging/delivery device and the additional port thereof to face the lifting device.

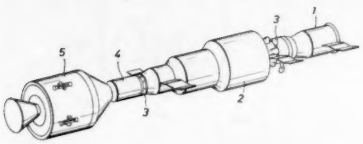
The movable member of the lifting device during its work-

ing stroke engages the body of the container and lifts it to engage the port of the charging/delivery device, in which position it supports this body at a loading operation. With the loading/unloading station being constructed in the disclosed manner, it becomes possible to load container both with piece goods and with materials in bulk form.

3,820,741
LATCH MECHANISM

Larry P. Ratcliff, Leaque City, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 26, 1972, Ser. No. 301,039
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 SD **17 Claims**

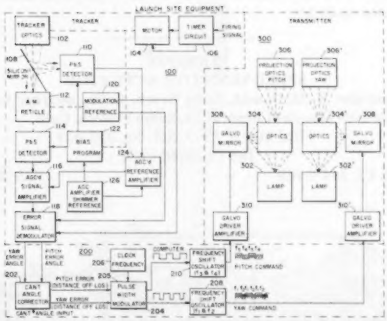


A novel latching mechanism has a latch member which will collapse when a member having a latching surface is passed over the latch member as it is brought into a position to engage the latch member and which will return and automatically engage the latching surface as the latching surface passes completely by the latch member. The latch member is pivotally attached to a linking member which is pivotally mounted in a housing. This arrangement has created new vector consideration, which make the release and disengagement of the latch member from the latching surface easier and more expedient than was possible with prior capture latches. The improved capture latch has made possible an improved spacecraft ring and finger mechanism which will provide substantially "fail safe" operator latching.

3,820,742
MISSILE GUIDANCE AND CONTROL SYSTEM

Robert A. Watkins, 142 La Vista Grande, Santa Barbara, Calif. 93103

Filed Feb. 8, 1965, Ser. No. 432,076
Int. Cl. F41g *7/12*
U.S. Cl. 244—3.11 **4 Claims**

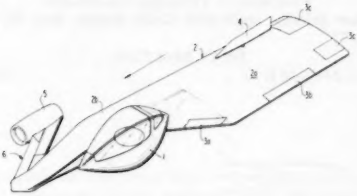


A missile guidance and control system comprising: a source of infrared radiation carried by a missile to be controlled, means carried by said missile for modulating said radiation, an infrared tracker responsive to said modulated radiation for generating tracking error signals when said missile deviates from a desired path, shimmer cancellation means connected to said tracker for eliminating shimmer noise from the tracking error signals, a computer connected to said tracker and responsive to said error signals for providing missile control signals, an infrared transmitter responsive to said computer for transmitting said control signals to said missile, a missile carried receiver for receiving said control signals, and means carried by said missile and responsive to the output of said receiver for controlling the flight of said missile.

3,820,743
VTOL AIR AND SPACE CRAFT

Frank G. Young, 26 Elm St., Saugerties, N.Y. 12477

Filed Mar. 17, 1972, Ser. No. 235,618
Int. Cl. B64c *1/00*
U.S. Cl. 244—4 R **4 Claims**

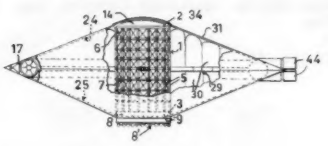


A vertical take-off and landing air and space craft which is basically a wing having a cabin mounted therein or thereon. An engine, engine mount, ailerons, elevators and rudders are pivotally mounted to the wing portion and are movable to a position relative thereto to cause a spinning motion to the wing, similar to that of a falling maple seed, to thereby impart a vertical ascent or descent to the craft; the engine, engine mount, ailerons, elevators and rudders being movable to another position to thereby impart horizontal, non-spinning flight to the craft.

3,820,744
LIGHTER-THAN-AIR AIRCRAFT

Harvey R. Denton, 339 Broadway, Alameda, Calif. 94501

Filed Mar. 12, 1973, Ser. No. 340,359
Int. Cl. B64b *1/04*
U.S. Cl. 244—5 **8 Claims**



A lighter-than-air aircraft of circular design having a vertically extending, central, hollow core of rigid material coaxially disposed within a horizontally disposed, annularly extending, rigid outer frame spaced outwardly of said core and positioned in a plane that is perpendicular to the vertical axis of said core and that intersects said core intermediate its upper and lower ends.

An upper annular row of substantially equally tensioned elongated elements, such as wire ropes, strips or elements of similar strength, extend radially outwardly from the upper and lower ends of the core to said outer frames. Said elements will

hereafter be generally called "wires" in the description and claims.

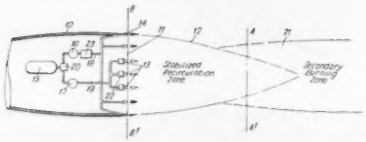
The wires of said upper row extend convergently to said frame, the latter having a vertical dimension substantially less than the height of said core, and the ends of the wires of both rows are secured to said frame. An outer skin may cover said wires and extend outwardly of said frame to form an approximately circular, relatively sharp outer edge around the aircraft.

Power actuated means are provided for driving the aircraft and for directionally manipulating it, with the interior of said aircraft between the rows of wires and wherever space is adequate, being filled with compartments or bags for gas, such as helium. Ballast, in the form of a payload is carried at the lower end of the hollow core.

3,820,745
AIRCRAFT

Robert Hugh Francis, deceased, 7 St. Michael's Rd., late of Farnborough, England (Lillian Lloyd Francis, executrix)

Filed May 19, 1972, Ser. No. 255,101
Claims priority, application Great Britain, May 20, 1971, 16101/71
Int. Cl. B64c *21/00*
U.S. Cl. 244—40 R **5 Claims**

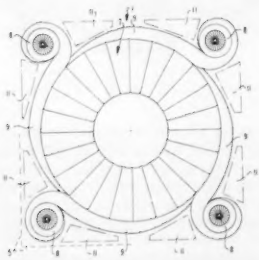


An aerodynamic body of transonic design having a bluff base and in which base drag is reduced by burning fuel not only immediately behind the base but also in a secondary region further aft beyond the zone of stabilised recirculation. Fuel is injected, by main injectors disposed at or near the periphery of the body, into the boundary between the main air stream and the recirculating air stream and is ignited on approaching said secondary region by the flame from pilot burners located inward of the ring of main injectors.

3,820,746
LIFT ENGINE ARRANGEMENT

Ralph Vedova, Munich, Germany, assignor to Motoren TurbinenUnion Munich GmbH, Munchen, Germany

Filed Sept. 24, 1971, Ser. No. 183,379
Claims priority, application Germany, Sept. 29, 1970, 2047782
Int. Cl. B64d *27/12*
U.S. Cl. 244—55 **37 Claims**

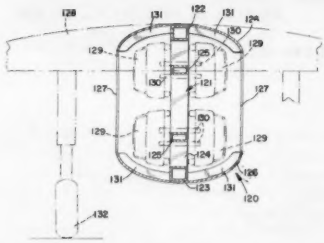


A lift engine assembly arrangement for installation in a predetermined geometrical installation area of an aircraft having a circular lift fan and at least one power unit for driving the lift fan positioned within the geometrical installation area.

3,820,747
TRUSS-TYPE CARGO-CARRYING VEHICLE

Norman E. Bateson, Munster, Ind., and William L. Pringle, Grosse Pointe Shores, Mich., assignors to Pullman Incorporated, Chicago, Ill.

Division of Ser. No. 65,461, Aug. 20, 1970, Pat. No. 3,675,592.
Filed Mar. 23, 1972, Ser. No. 237,422
Int. Cl. B64c *1/20*
U.S. Cl. 244—118 R **7 Claims**



A truss structure includes upper and lower beams with vertical interconnecting beams on which cargo of any type may be suspended. The truss structure is adapted to be supported on horizontally spaced wheel suspensions, such as is common in over-theehighway vehicles, or it may be disposed in and be connected to structural components in aircraft wherein the truss structure supports the cargo and provides a primary structural component of both modes of transportation.

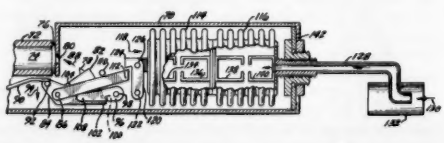
In a railway car a relatively narrow upright truss structure is supported at its opposite ends on trucks. The truss structure is provided at opposite ends with short sill sections which contain coupler housings supporting conventional couplers. At opposite ends of the truss structure horizontal stabilizing members extend laterally outwardly of the truss structure and are adapted to be connected to conventional single or double axle trucks in conventional fashion. The narrow truss structure is the sole structural support of the car and provides on opposite sides thereof, between the trucks, a free and unencumbered space to which ready access may be had by suitable powered handling devices which may lift cargo into position to be connected and suspended on opposite sides of said truss structure.

A modified embodiment comprises a railway car which includes a pair of truss sections which have outer ends supported on single axle trucks, and adjacent inner ends supported on double axle trucks by means of an articulated connector assembly.

3,820,748
SPEED SENSITIVE ACTUATOR

Alexander B. McDonald, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed May 3, 1973, Ser. No. 357,021
Int. Cl. B64d *17/52*
U.S. Cl. 244—149 **9 Claims**



A speed sensitive device to control the operation of an aircraft escape system and to improve its performance at lower

speed conditions. The exterior of a bellows is exposed to atmospheric pressure and the inside of this or another bellows connected thereto is exposed to the total pressure of the airstream. The firing mechanism will not release until a combination of predetermined values of atmospheric pressure and dynamic pressure is present.

3,820,749

TREE WATERING STAND

Thomas R. Leonard, 1558 N. Shepherd Dr., Camarillo, Calif. 93010, and James R. Birkenshaw, 223 Teloma Dr., Ventura, Calif. 93003

Filed Apr. 13, 1973, Ser. No. 350,722
Int. Cl. A47g *33/12*
U.S. Cl. 248—44 **5 Claims**

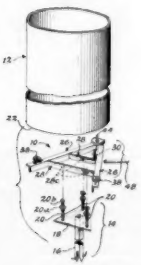
There is provided an arrangement which may be used in an apartment, home, or business establishment, for holding a tree in a vertical position while supplying it with water.

3,820,750

CONTAINER ANCHOR RACK

Robert F. Deike, 2116 Pioneer Ave., Cheyenne, Wyo. 82001

Continuation-in-part of Ser. No. 169,919, Aug. 9, 1971. This application Sept. 25, 1972, Ser. No. 291,791
Int. Cl. B65f *1/14*
U.S. Cl. 248—154 **6 Claims**



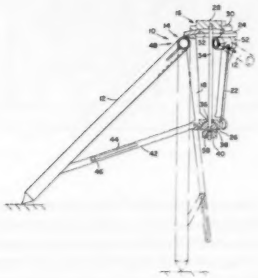
An inexpensive rack including a stand for supporting a barrel, drum, garbage can or the like container in spaced relation above the ground and abutments in the form of rollers and a rotatably mounted cam upstanding from the stand for lockably engaging with the inner surface of an annular rim extending below the bottom wall of the container.

3,820,751

SPHERICAL HEAD TRIPOD

Raymond I. Strickland, Huntsville, and Lonnie L. Looger, Madison, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 22, 1972, Ser. No. 308,897
Int. Cl. F16m *11/14*
U.S. Cl. 248—181 **3 Claims**



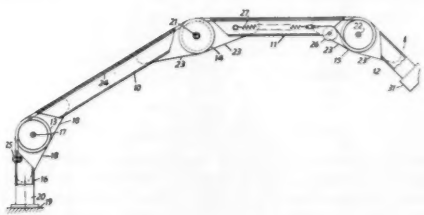
A spherical leveling head tripod for use in making an attached instrument support platform level. The platform is mounted on the tripod for relative movement with respect to the leveling head. After setting up a tripod and roughly leveling it, the platform is moved any direction in a 360° arc on the spherical head. When a level indicator shows that a level position has been obtained the platform is then locked in a fixed position.

3,820,752

ADJUSTABLE ARTICULATED SUPPORT ARM

John Anderson Oram, Osborne Cottage, Heath Rd., Leighton, England

Filed Sept. 14, 1972, Ser. No. 289,026
Claims priority, application Great Britain, Sept. 16, 1971, 43245/71
Int. Cl. F26s *1/00*; A47g *29/00*
U.S. Cl. 248—278 **16 Claims**

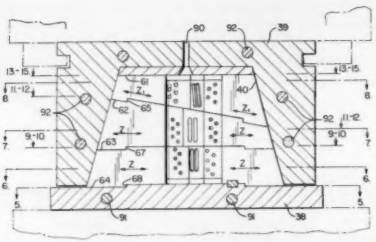


An adjustable, articulated support for supporting a load, such as a lamp or dentist's tray, has a base and at least two arms. One arm is pivoted on the base and the second arm is pivoted to the first. A cable drum is secured to the first arm and a tensioned cable anchored at one end to the base extends at least once round the drum and passes over an arcuate guide on the second arm. To release the support for adjustment the tension is released in the cable.

3,820,753
APPARATUS FOR MOLDING CERAMIC CORES AND WAX OR PLASTIC PATTERNS

Virgil V. Stanciu, Rocky River, Ohio, assignor to Tempcraft Tool & Mold, Inc., Cleveland, Ohio

Filed Dec. 4, 1972, Ser. No. 311,798
Int. Cl. F16m *11/32*
U.S. Cl. 249—164 **6 Claims**

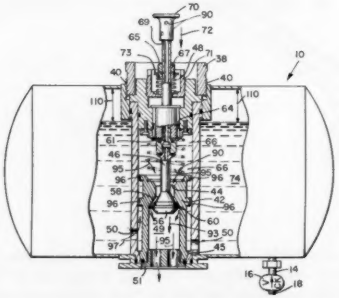


Apparatus is provided for molding ceramic cores and patterns to be used for investment casting blades or vanes for a jet engine, turbine or the like and having such geometry as to provide a strong structure with internal passages permitting the flow of a cooling medium. An essential feature is a mold wherein the positive or negative image of the elongated internal structure is positioned with its longitudinal dimension generally vertical which permits a freedom of design wherein non-parallel surfaces of the image may extend at any angle around a 360° orbit, or inclined upwardly or downwardly, and the mold includes a plurality of pull slides which may be at various levels and, after the image is molded, may be withdrawn outwardly in predetermined sequence as necessary to withdraw each pull slide in a path parallel or normal to the molded surfaces on that portion of the image enclosed by the radially inner end of that individual slide.

3,820,754
HYDRAULIC FLUSH TANK WITH IMPROVED SEATING AND RESEALING MEANS

Roger P. Caron, North Andover, and Thomas P. Howard, Ashland, both of Mass., assignors to Water Control Products, Inc., Birmingham, Mich.

Filed Aug. 17, 1972, Ser. No. 281,348
Int. Cl. F16k *31/38;* **E03d** *3/02;* **F16k** *21/18*
U.S. Cl. 251—38 **10 Claims**

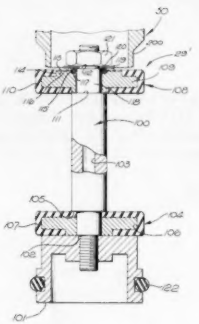


A valve, plug and pressure responsive diaphragm combination for use in a flushing device of the type which includes a closed container for receiving and retaining a quantity of pressurized water. The plug is capable of being seated within the outlet of the tank and has an aperture therein into which the valve is slidably received. The valve is attached to a stem which is constantly urged upwardly by the action of a spring. The valve is pushed downward from a seated position in the plug against the action of the spring when the tank is flushed. This downward movement of the valve opens the aperture in the plug in which the valve was seated which decreases the pressure within the cylinder above the plug and causes the plug to move upwardly from its seated position in the tank outlet thus opening the outlet for the passage of water from the tank during the flushing cycle. As the tank empties, the plug drops. To reseal the bowl after the tank has been flushed, the spring action of the valve tends to prevent the plug from seating thus allowing some liquid to flow through the outlet as the tank is being filled. After the tank has been flushed and while the bowl is being resealed, the plug responds to pressure created by liquid coming into the tank by moving slowly in opposition to the force of the spring and valve until the plug is seated and the tank is resealed.

3,820,755
POPPET VALVE

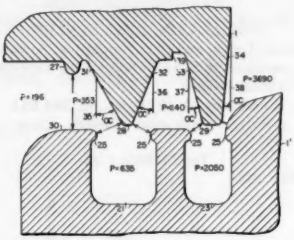
Roger Greenwood, Northridge, and Donald F. McGregor, Burbank, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 20, 1973, Ser. No. 334,052
Int. Cl. F16k *1/32*
U.S. Cl. 251—85 **2 Claims**



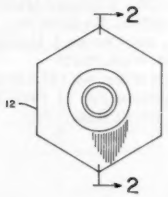
A poppet valve including a valve stem having a rubber O-ring axially compressed against a rigid disc portion of a valve therearound to provide a fluid tight seal between the O-ring and both the valve stem and the disc. The O-ring approximately aligns the valve for proper initial seating prior thereto. However, the O-ring also permits improved final seating because it is resilient and allows the valve to rock relative to the stem until it finds the best seal with the seat. The use of this valve-to-stem connection is valuable in a number of applications. In some cases it is difficult to hold adequate manufacturing tolerances so that there are intolerable differences in the locations or orientations of the valve seat axis and the valve axis. The said valve-to-stem connection is also valuable when two valves are operated in tandem on the same stem. When one valve seats, the relative locations and orientations of both valves and valve seats are not so critical.

3,820,756
SEQUENTIALLY OPERABLE CONTROL VALVE FOR A STEAM TURBINE
Charles A. Meyer, 2970 N. Providence Rd., Media, Pa. 19063
Division of Ser. No. 153,503, June 16, 1971, Pat. No. 3,763,894. This application Mar. 12, 1973, Ser. No. 340,127
Int. Cl. F16k *1/52*
U.S. Cl. 251—121 **3 Claims**



A sequentially operable control valve for an axial flow steam turbine having a plurality of plugs which successively lift from their seats, the plugs and seats having surfaces which cooperatively produce consecutive throttling stages as steam passes therebetween, the first plug to lift off its seat having the greatest number of consecutive throttling stages and plugs which successively lift off their seats having a smaller number of consecutive throttling stages, the velocity through the consecutive throttling stages being slightly less than the speed of sound as the plug lifts, thus keeping the intensity of vibration and noise produced by this valve at a low level.

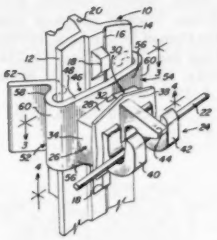
3,820,757
COAXIAL VALVE
John E. Siebel, 5563 W. Washington Blvd., Santa Monica, Calif. 90016
Filed July 3, 1972, Ser. No. 268,760
Int. Cl. F16k *31/02*
U.S. Cl. 251—139 **2 Claims**



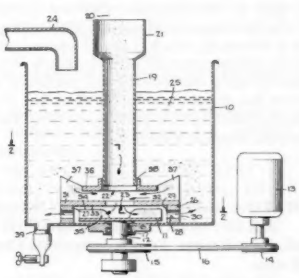
A compact solenoid valve having a mass produced valve assembly similar to that used as the valve core in vehicle tires and like applications and further having a minimum number of parts for ease of assembly and economy of manufacture.

3,820,758
ELECTRIC FENCE INSULATOR FOR T-SHAPED POSTS
Albert T. Berg, Jr., and Howard Langlie, both of Eilendale, Minn. 56026
Filed Sept. 22, 1972, Ser. No. 291,367
Int. Cl. A01k *3/00*
U.S. Cl. 256—10 **13 Claims**

Our all plastic insulator includes a body having means projecting forwardly therefrom for holding an electric fence wire with means at the rear thereof for resiliently gripping a T-shaped post. The post gripping means comprises a pair of resilient generally C-shaped portions extending laterally from the rear wall on the body. The rear wall is composed of two outwardly and rearwardly angling panels, a first leg section of each C-shaped portion forming a continuation of the rear wall panel to which it is connected. A wing panel projects at an angle from the free edge of a second leg section belonging to one of the C-shaped portions. The wing panel functions as a cam, enabling the installer to flex sufficiently the C-shaped portion to which it is connected to effect attachment of the insulator to a T-shaped post. The wing panel additionally serves as a handle or lever to facilitate removal of the insulator from the post should it become desirable to effect its detachment.



3,820,759
CENTRIFUGAL MIXING APPARATUS AND METHOD
Douglas W. Hege, Woodland Hills, Calif., assignor to Hege Avanced Systems Corporation, Woodland Hills, Calif.
Filed June 5, 1972, Ser. No. 259,678
Int. Cl. B01f *5/16, 7/20, 15/02*
U.S. Cl. 259—24 **12 Claims**



An improved apparatus and method for mixing a second material into a first fluid material includes a container for the first fluid material, a motor driven centrifugal impeller, and a conduit having an outlet coaxial with and adjacent to the centrifugal impeller for feeding the second material into the center of the impeller. The impeller is located in the container of fluid material, and the improved apparatus includes means for directing a portion of the fluid from the container inward for mixing with the second material as it enters the center of the impeller and means for directing at least a portion of the mixture flowing from the impeller outward for dispersion in the fluid in the container. The apparatus preferably also includes means for recirculating a portion of the mixture from the impeller directly back for mixing with and imparting momentum to the first and second materials as they enter into the center of the impeller. An alternate embodiment of the ap-

paratus includes a venturi section coaxially surrounding the conduit for feeding the second material into the center of the impeller and means for recirculating at least a portion of the mixture flowing from the impeller back to the inlet of the venturi section to augment the pressure at the impeller inlet.

3,820,760
MIXING MACHINES

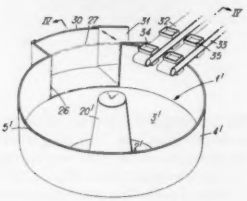
Rudolf F. L. Milik, Welwyn Garden, England, assignor to Trevor G. Evans, Michael James & Geoffrey Alan Ryder Trading as the Firm of Design Link, Hertfordshire, England

Filed Jan. 7, 1972, Ser. No. 216,054

Claims priority, application Great Britain, Feb. 9, 1971, 4279/71; Apr. 8, 1971, 9075/71

Int. Cl. B01f *7/16, 15/02*

U.S. Cl. 259—8 **13 Claims**



A mixing machine comprises a circular rotary dished platform having a driving mechanism by which it is rotatable about a vertical central axis, a wall which closely surrounds the platform and extends upwards from the rim of the platform, but which does not partake in the rotation of the platform, two conveyors or other means for supplying two or more materials to be mixed together either continuously or batch by batch to the platform and means for discharging mixed material from the platform by centrifugal action as the platform rotates. The discharging means may consist of a discharge port formed in the wall and this port may then either be permanently open so that materials which are supplied continuously are also discharged continuously after mixing or the port may have a closure by which it can be opened and closed to discharge the mixed materials batch by batch. When the port is permanently open, the materials are preferably supplied to the platform just downstream in the direction of rotation of the port and a radial baffle is provided between the conveyors or other supply means and the port.

3,820,761
ROTATING AGITATOR FOR A CYLINDRICAL RECEPTACLE OF GREAT LENGTH

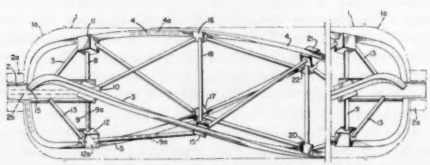
Jean Rigal, Saint-Etienne, France, assignor to Creusot-Loire, Paris, France

Filed Mar. 23, 1972, Ser. No. 237,269

Claims priority, application France, Mar. 26, 1971, 71.10816

Int. Cl. B01f *7/02*

U.S. Cl. 259—109 **3 Claims**



A rotary agitator for use in a long cylindrical container, which may for example, be a chemical processing or reaction chamber. The agitator has two bearing members which cooperate with bearings in the container to support the agitator in the container. A plurality of helical blades are connected directly to each of the bearing members. A number of lattice rods are connected between the blades and the bearing members, and between the blades themselves. The bearings, blades and rods may be hollow and may define flow paths for cooling fluid.

3,820,762
MOBILE CONCRETE STATION

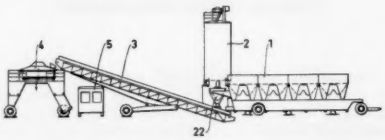
Sture Bostrom, Umea, and Gert Nordstrom, Sormjole, both of Sweden, assignors to Robacks Medaniska Verkstad Bostrom & Soner, Umea, Sweden

Filed June 20, 1972, Ser. No. 264,651

Claims priority, application Sweden, June 23, 1971, 8213/71

Int. Cl. B01f *5/42*

U.S. Cl. 259—154 **10 Claims**



A mobile or movable concrete station consists of several separate interconnectable units including an aggregate weighing unit, a cement silo unit, a belt conveyor unit and a concrete mixer unit with a cement scale vessel arranged in connection to the discharge end of the aggregate weighing unit for adding weighed cement to the aggregate material at the starting end of the conveyor unit which is adapted to connect the aggregate weighing unit with the concrete mixer unit. Each of the units in the concrete station is mounted on one or more wheeled carriages so that each unit individually or coupled in pairs can be moved by means of a traction vehicle or by railway.

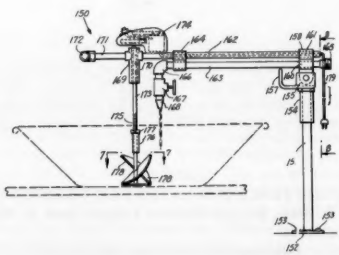
3,820,763
PORTABLE CEMENT MIXER

Charles Questi, Sr., 406 E. Weshkah St.; Jerry T. Kadlec, 9202 Fortune Ave., and Charles J. Questi, Jr., 628 Hahna Ave., all of Aberdeen, Wash. 98520

Continuation-in-part of Ser. No. 147,137, May 26, 1971, abandoned. This application July 11, 1972, Ser. No. 270,823

Int. Cl. B28c *5/16*

U.S. Cl. 259—178 R **3 Claims**



A portable cement mixer for mixing cement in wheelbarrows or other conveyances with the mixer being detachably

mounted on a post fixed to the ground and including a swingable arm carrying a mixer on the end thereof for engaging in a wheelbarrow to mix cement therein. In one form of the invention a water supply is provided attached to the mixer and the mixer blade is adjustable in height to reach the bottom of wheelbarrows of varying depths.

3,820,764

SEWAGE TREATMENT PLANT EQUIPPED WITH AN AERATION IMPELLER

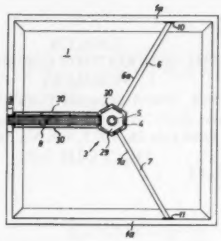
Joseph Richard Kaelin, Villa Seeburg Buocks, Buochs, Switzerland

Filed Jan. 19, 1972, Ser. No. 218,912

Claims priority, application Switzerland, Jan. 26, 1971, 1162/71

Int. Cl. B01f 7/16

U.S. Cl. 261—91 **5 Claims**



A sewage treatment plant is equipped with a motor driven aerator which is supported in a basin at least at three points. The support mechanism for the aerator embodies at least two supports which at least at their ends closest to the aerator enclose an acute angle with a horizontal plane which is less than 45°.

3,820,765

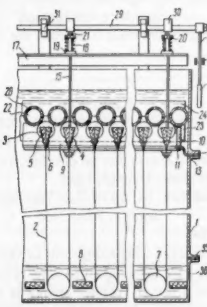
SPRAY-TYPE HEAT EXCHANGER

Ivan Nikolaevich Purtov, ulitsa Kuibysheva, 32, kv. 38; Nikolai Filippovich Trofimov, ulitsa Kosmonatov, 9, kv. 6, and Makhmut Mukhametovich Zhdanov, ulitsa Krasnaya Pozitsia, 29, kv. 36, all of Kazan, U.S.S.R.

Filed May 10, 1972, Ser. No. 252,012

Int. Cl. B01f 3/04

U.S. Cl. 261—103 **10 Claims**



A heat exchanger is provided with a heat exchange assembly comprising separate sheets attached to supporting bars. The supporting bars are secured together and form a lattice suspended on spring-loaded rods, which makes it possible to adjust the size of gaps for passage of liquid. Alternative embodiments of means for securing the sheets of the heat exchange assembly to the rods are described.

3,820,766

VACUUM FURNACE

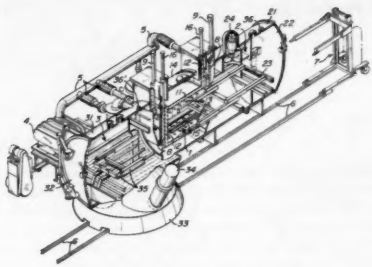
Ferdinand Limque, Nijmegen, Netherlands; Hans Bertrand, Goch, Germany, and Irvin P. Bielefeldt, Rockford, Ill., assignors to Ipsen Industries International Gesellschaft mit beschrankter Haftung, Kleve, Germany

Filed Feb. 28, 1972, Ser. No. 229,903

Claims priority, application Germany, Mar. 1, 1971, 2109507

Int. Cl. C21d 1/62

U.S. Cl. 266—4 A **4 Claims**



A vacuum furnace having an oil quenching chamber on one side and a gas chilling chamber on the other side of a heating chamber, while gate means are respectively interposed between the heating chamber and each of the two other chambers for selectively interrupting or permitting communication of the heating chamber with either one of the other two chambers, each of the three chambers being adapted selectively and individually to be evacuated.

3,820,767

APPARATUS FOR THE TREATMENT OF MOLTEN METAL

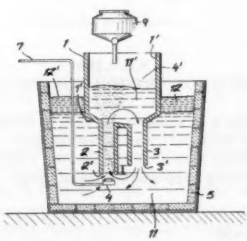
Paul Metz, Luxembourg, Luxembourg, assignor to Acieries Reunies de Burbach-Eich-Dudelande, S.A., ARBED, Grand Duchy of Luxembourg

Filed Feb. 2, 1972, Ser. No. 222,842

Claims priority, application Luxembourg, Feb. 4, 1971, 62545

Int. Cl. C21c 7/00

U.S. Cl. 266—34 T **5 Claims**



An apparatus for the treatment of molten metals, e.g., cast iron or steel in a vessel such as a furnace or ladle wherein an

upwardly moving stream of the molten is induced by confining a column thereof and injecting a gas beneath this column into the melt. A treatment receptable is located above the column which, in turn, may be separated from any slag layer overlying the bath, the receptacle having a downwardly moving column returning the metal to the bath. The receptacle may be maintained at a pressure other than atmospheric or may be open to the atmosphere.

3,820,768

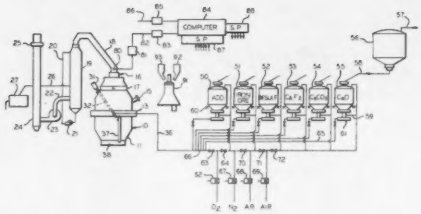
STEEL CONVERSION METHOD AND APPARATUS

Walter Sieckman, Pittsburgh; Harvey W. Maurice, Butler, and Jai K. Pearce, Pittsburgh, all of Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed July 19, 1971, Ser. No. 163,591

Int. Cl. C21c *5/42*

U.S. Cl. 266—35 **9 Claims**



A vessel for converting impure molten metal to steel has bottom tuyeres for blowing oxygen upwardly through the molten metal. Various additives which have heretofore been introduced into the top of the converter vessel are introduced as fine powders which are entrained in the oxygen or other gas being blown into the vessel. Finely powdered iron ore, desulphurizing agents, fluorspar, limestone and burnt lime are typical of materials which are bottom blown. A closed duct delivers the carbon monoxide and other gases produced in the vessel to apparatus which removes solids from the gas so that it can be burned in a flare chamber. The temperature of the melt is monitored continuously as is the composition of the gas at the entrance end of the duct. This data is fed into a computer which, in turn, regulates the flow of the bottom fed gases and the powdered additives in accordance with the desired metallurgy of the melt. The invention is particularly well adapted for converting existing steel making facilities to reduce production cost, to reduce capital investment and to meet pollution control standards.

3,820,769

LADLE SWING TOWER FOR A CONTINUOUS CASTING INSTALLATION

Shigeichi Kishi, and Masao Kato, both of Niihama, Japan, assignors to Concast AG, Zurich, Switzerland

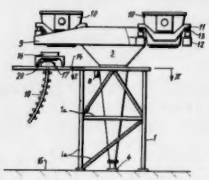
Filed Sept. 25, 1972, Ser. No. 292,077

Claims priority, application Japan, Sept. 28, 1971, 46-87838[U]

Int. Cl. B22d *11/10*; **F27d** *3/14*

U.S. Cl. 266—38 **4 Claims**

A ladle swing tower for a continuous casting installation or plant equipped with pivotal carrier arms for the transport of casting or pouring vessels to and from a casting position. There is provided an inner rotatable structure of the ladle swing tower possessing at its lower end a bearing block located at the plane of the floor of the plant. There is also provided an



outer stationary structure possessing a guide track at the level of the casting platform for rollers arranged at the inner rotatable structure.

3,820,770

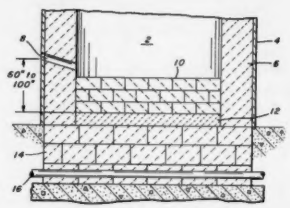
SUB-HEARTH CONSTRUCTION FOR METALLURGICAL FURNACES

Roland B. Snow, Mount Lebanon Township, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed July 26, 1973, Ser. No. 382,800

Int. Cl. C21b *7/06*

U.S. Cl. 266—43 **6 Claims**



The construction of the invention comprises a plurality of layers of refractory material subjacent the hearth of a furnace, such as a blast furnace, between vertical carbon walls surrounding the hearth and projecting below the bottom thereof; a heat-barrier layer of non-iron-reactive material subjacent the refractory layers, and a plurality of layers of carbon subjacent the heat-barrier layer. A passageway for cooling fluids optionally extends through the lowermost layers of carbon. The improved sub-hearth construction of the invention reduces considerably the heat loss from the bottom of the furnace hearth.

3,820,771

ENERGY ABSORBING UNIT

Lamar L. Kerr, Centerville; James M. Pees, Dayton, and Robert J. Riner, Centerville, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

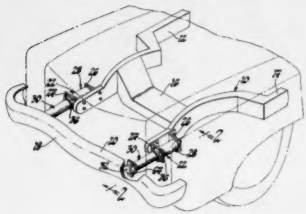
Filed Nov. 24, 1972, Ser. No. 309,260

Int. Cl. F16f *5/00*

U.S. Cl. 267—116 **4 Claims**

An improved energy absorbing unit of the hydropneumatic type wherein the rate at which the unit returns to a fully extended condition after an impact stroke is retarded, the unit including a piston tube subassembly telescopically disposed on a cylinder tube subassembly, a metering pin on the cylinder tube subassembly adapted for cooperation with an aperture on the piston tube subassembly in defining a primary orifice for throttling the flow of working fluid thereby to effect energy absorption during telescopic collapse of the unit, and a valve

disc on the piston tube subassembly adapted for sliding and sealing engagement on the metering pin and movable by the latter during telescopic extension of the unit to a closed position closing the primary orifice and defining a secondary orifice for throttling the flow of working fluid thereby to retard relative telescopic extension.



3,820,772

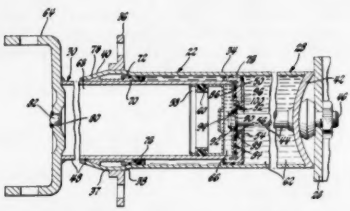
ENERGY ABSORBING UNIT

Lamar L. Kerr, Centerville; James M. Pees, Dayton, and Robert J. Riner, Centerville, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1972, Ser. No. 309,261

Int. Cl. F16f *5/00*

U.S. Cl. 267—116 **2 Claims**



An improved energy absorbing unit of the hydropneumatic type wherein the rate at which the unit returns to a fully extended condition after an impact stroke is retarded, the unit including a piston tube subassembly telescopically disposed on a cylinder tube subassembly, a metering pin on the cylinder tube subassembly adapted for cooperation with an aperture on the piston tube subassembly in defining a primary orifice for throttling the flow of working fluid thereby to effect energy absorption during telescopic collapse of the unit, and a flexible valve disc on the piston tube subassembly adapted to normally seal against the metering pin except during telescopic collapse of the piston tube subassembly when the pressure of the working fluid distends the valve disc. When the valve disc is sealed against the metering pin, as during telescopic extension of the piston tube subassembly, the working fluid is directed through secondary throttling orifices which function to retard the rate of telescopic extension.

3,820,773

APPARATUS FOR FEEDING A WORKPIECE INTO CUTTING POSITION ON A CUTTING DEVICE

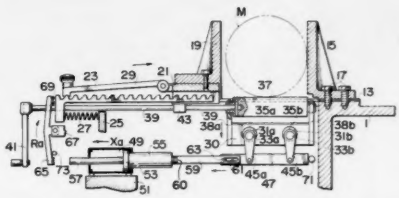
Tsuneo Aizawa, Isehara, Japan, assignor to Amada Company Limited, Kanagawa-ken, Japan

Filed Sept. 27, 1971, Ser. No. 183,953

Claims priority, application Japan, Sept. 30, 1970, 45-85122

Int. Cl. B23q *3/08*

U.S. Cl. 269—32 **6 Claims**



Apparatus for feeding a workpiece into cutting position on a cutting device, especially on a band-sawing device, wherein a work feed roller is raised above or lowered below the upper surface of the base of the cutting device by using hydraulic pressure for operating a hydraulic vice, thus relieving manual labor for feeding the workpiece, and enabling an extremely simplified feeding operation.

3,820,774

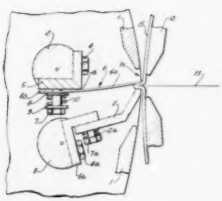
FOLDING-BLADE CYLINDER FOR USE IN ROTARY FOLDING MACHINES

Klaus Hertrich, Waldsiedlung, Germany, assignor to Veb Polygraph Leipzig Kombinat Fur Polygraphische Maschinen Und Ausrustungen, Leipzig, Germany

Filed June 29, 1972, Ser. No. 267,708

Int. Cl. B65h *45/16*

U.S. Cl. 270—63 **9 Claims**



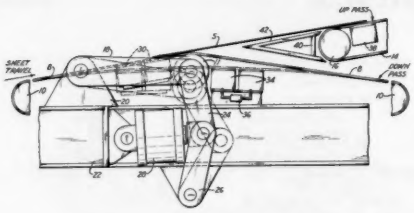
A folding-blade cylinder has a circumferential wall provided with one or more axially extending slots. A folding blade of springy sheet material is located within the cylinder and has an edge portion extending along the slot and another edge portion remote therefrom, with the other edge portion overlying a surface of the mounting element an edge of which faces towards the slot. Screws extend through openings in the other edge portion of the blade with such freedom that the blade can pivot about the edge of the mounting member and biasing springs normally tend to maintain the folding blade against such pivoting but permitting the same to yield and to pivot when a force is applied against it in requisite sense at its edge portion extending along the slot.

3,820,775

APPARATUS FOR DEFLECTING SHEET-LIKE MATERIAL

Paul W. Miller, Warren, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Oct. 12, 1972, Ser. No. 297,117
Int. Cl. B65h 29/16, 29/60
U.S. Cl. 271—64 4 Claims



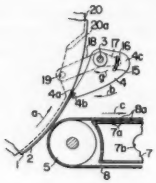
The disclosure of this invention relates to a sheet deflecting arrangement as employed, for example, in a shearing line for rolled metal sheets. The deflector comprises an endless entry conveyor belt for transporting succeeding sheets away from the shear and to one of two different paths of travel. A diverter roll is arranged to engage the non-sheet supporting side of the belt to cause the belt to be displaced into a raised position to deflect the sheets to an upper path of travel and to be displaced to a lower position where the sheets can be fed to a lower path of travel.

3,820,776

SHEET STRIPPING DEVICE

Sakae Fujimoto, Tokyo; Tokokazu Satomi, Yokohama; Mituo Tomizuka, Tokyo; Masayauki Yamauchi, Kawasaki, and Toshiyuki Ogawa, Kanagawa-ken, all of Japan, assignors to Kabushiki Kaisha Richo, Tokyo, Japan

Filed May 10, 1972, Ser. No. 251,909
Claims priority, application Japan, May 10, 1971, 46-37200; Sept. 17, 1971, 46-72747; Dec. 28, 1971, 46-367
Int. Cl. B65h 29/56
U.S. Cl. 271—80 13 Claims



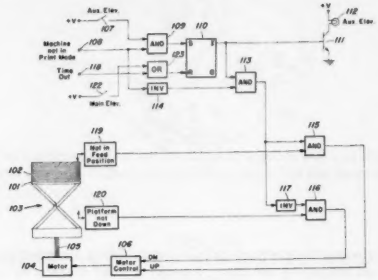
A device comprising a plurality of separators each pivotally supported at the base and formed at the free end with a sheet pick-off claw and a sheet guide lip contiguous with the claw. The sheet pick-off claws are adapted to be brought into engagement with the peripheral surface of a drum to pick off the leading end of a sheet electrostatically adhering to the peripheral surface of the drum, and the leading end of the sheet thus picked off is brought into abutting engagement with the sheet guide lips to push and move the lips as the drum rotates. The separators move in pivotal motion as successive portions of the sheet are separated from the peripheral surface of the drum in a direction in which the sheet pick-off claws are brought out of engagement with the drum and the sheet is guided by the lips to change the direction of its movement and move away from the separators toward capture and conveyor means.

3,820,777

ELEVATOR ASSEMBLY POSITIONING CONTROL

Edward G. Reehil, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 11, 1972, Ser. No. 270,577
Int. Cl. B65h 1/18
U.S. Cl. 271—155 10 Claims



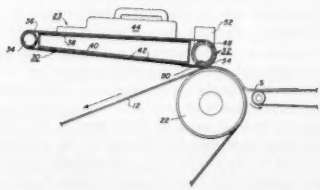
Apparatus for regulating the position of an auxiliary elevator assembly included in an electrostatic reproduction machine wherein sheets of material are stacked upon the auxiliary elevator assembly is disclosed in accordance with the teachings of the present invention. Selecting means responsive to the manual operation of switch means is provided for selectively producing a first signal to enable the sheets stacked upon the auxiliary elevator assembly to be transported to the electrostatic reproduction machine and for producing a second signal to enable sheets stacked upon a main elevator assembly to be transported to the electrostatic reproduction machine. A reversible electric motor is mechanically coupled to the auxiliary elevator assembly for imparting bi-directional motion to the auxiliary elevator assembly. Drive control means for controlling the direction of rotation of the electric motor is coupled to the selecting means and drives the electric motor in a first direction in response to the first signal whereby the auxiliary elevator assembly is driven to a proper sheet feeding position; said drive control means serving to drive the electric motor in a second direction in response to the termination of the first signal whereby the auxiliary elevator assembly is driven to a quiescent position.

3,820,778

VACUUM STRIPPING ROLL WITH ROTARY PICKUP SLOTS

George E. Veillard, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

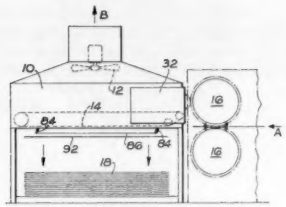
Filed Dec. 6, 1972, Ser. No. 312,555
Int. Cl. B65h 29/56
U.S. Cl. 271—174 2 Claims



A device for removing a copy sheet from a photoconductive surface and transporting the copy sheet therefrom. A belt type transport system is provided with rotating vacuum ports in the transport belt roller assembly to lift the leading edge of a copy

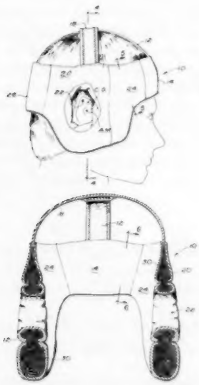
sheet being advanced on a photoconductive surface. Vacuum ports in the belt transport platen communicate with perforations in the transport belts to provide a low pressure area adjacent the belts for retaining the copy sheet on the transport for movement away from the photoconductor.

3,820,779
SHEET DELIVERY APPARATUS
Thomas Desmond Bishop, Solihull, England, assignor to The Deritend Engineering Company, Limited, Birmingham, England
Filed Apr. 24, 1972, Ser. No. 246,566
Int. Cl. B65h *29/32, 29/54, 29/68*
U.S. Cl. 271—180 **4 Claims**



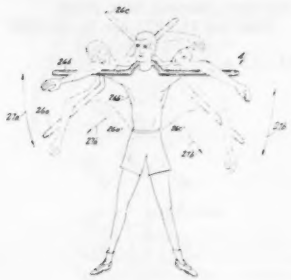
A feeder for cut blanks of card and the like, having parallel conveyor belts with suction applied to draw the blanks against the lower run of the belts, ejector strips between the belts to be moved down into engagement with the blanks to brake them frictionally, seals carried by the ejectors to close off suction to the blanks without interfering with the suction means, and a Geneva mechanism for slowing the belts in timed relation to the ejector movement, so that the blanks are slowed, stopped and ejected to form a stack below the belts.

3,820,780
HEAD WEIGHT AND METHOD OF USE
Elmer L. Tarbox, P.O. Box 5426, Lubbock, Tex. 79408
Filed Sept. 23, 1971, Ser. No. 183,160
Int. Cl. A63b *23/00*
U.S. Cl. 272—57 R **6 Claims**



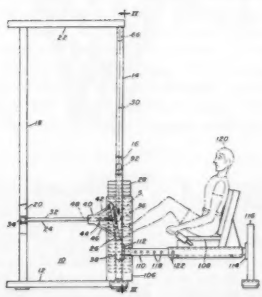
A weighted head band is worn by an athlete to strengthen the neck muscles. The band is made of fabric, filled with shot and supported by medial and traverse straps over the top of the head. The band weighs between eight and twelve pounds and the weight is concentrated about the ears of the athlete.

3,820,781
BODY WAIST EXERCISER
John F. Kane, 1793 Riverside Dr., New York, N.Y. 10034
Continuation-in-part of Ser. No. 244,620, April 17, 1972, abandoned. This application June 8, 1973, Ser. No. 368,270
Int. Cl. A63b *23/02, 69/36*
U.S. Cl. 272—57 R **11 Claims**



In a preferred embodiment, particularly for use by golfers for training body muscles to twist and bend as muscles normally do in a conventional golf swing, or for the general public in body-building, there is provided an elongated exerciser shaft of about 40 inches in length and 1 or 2 inches in cross-sectional diameter, the shaft having a mid-section of yoke shape-defined arc of 180° of a size about snugly fittable around the neck of a person at shoulder height, with the yoke mid-section arcing from alignment between proximal ends of about diametrically oppositely extending elongated shafts, the arced mid-section being such that the oppositely extending shafts are positioned substantially forwardly of the body of the shoulders respectively when the yoke mid-section is mounted around the back of a person's neck, thereby avoiding unnatural tensions on the shoulders during a draping of respective fore-arms forwardly over the respective shafts distal portions thereby making possible a natural upright posture while moving the upper torso to and fro while maintaining from the waist downwardly substantially stationary in order to reduce flabbiness around the waist, the cross-section of the respective elongated shafts being substantially rounded and the shafts each gradually tapering in distally outwardly directions.

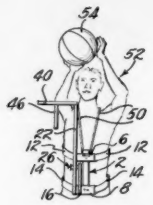
3,820,782
LEG EXERCISING APPARATUS
Larry A. Salkeld, 928 Harvey Rd., Monroeville, Pa. 15146
Filed Aug. 13, 1971, Ser. No. 171,525
Int. Cl. A63b *21/06*
U.S. Cl. 272—58 **8 Claims**



An exercising apparatus of the leg-press type characterized by footpedals which move back and forth on a horizontal

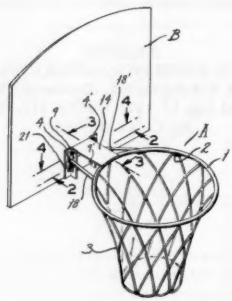
track in a position aligned with and in front of a user's chair and which footpedals are connected through a roller chain to a stack of weights which is disposed on one side of the path of travel of the footpedals.

3,820,783
BASKETBALL TRAINING AID
Gerald W. Caveness, Marietta, Miss. 38856
Filed May 15, 1972, Ser. No. 252,985
Int. Cl. A63b *69/00*
U.S. Cl. 273—1.5 A **7 Claims**



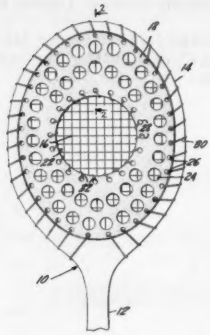
A belt-supported bracket carries an upwardly and forwardly extending arm having a transverse gage bar at its upper end to indicate the height to which a user's elbow should be raised before extending the forearm to "shoot" a basket, in the game of basketball. A guide bar depending from the gage bar indicates the proper lateral position of the user's elbow. The parts are relatively adjustable to adapt the device to users of different sizes or physiques.

3,820,784
COLLAPSIBLE BASKETBALL GOAL
Robert A. Boitano, and Charles J. Engle, both of St. Louis, Mo., assignors to Gared Corporation, St. Louis, Mo.
Filed July 9, 1973, Ser. No. 377,527
Int. Cl. A63b *63/02*
U.S. Cl. 273—1.5 R **6 Claims**



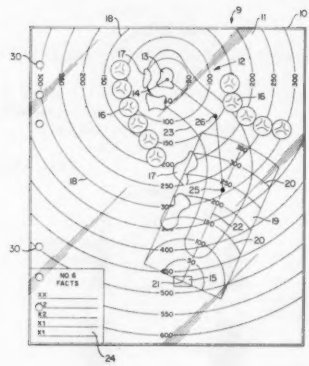
The combination of a backboard and basketball goal wherein mounts are fixed upon the backboard and the basketball goal is hingedly supported upon said mounts whereby the said goal may swing within a vertical plane between downward, or game playing condition, and upward, inoperative position, with the ring of the goal substantially planarwise parallel to the backboard. Brace rods are affixed at one of their ends to the goal and are individually detachably securable to said mounts. Each brace is adjustable to assure proper positioning of the goal in usage.

3,820,785
PRACTICE TENNIS RACKET
Peter W. Occhipinti, 672 Downing St., Teaneck, N.J. 07666, and Anthony Toriello, 8 White Pine Rd., Upper Saddle River, N.J. 07459
Filed Dec. 13, 1972, Ser. No. 314,547
Int. Cl. A63b *69/38*
U.S. Cl. 273—29 A **7 Claims**



A practice tennis racket comprising a handle and a racket head provided with a masking cover overlying the strings on each side of the racket head. The cover masks a preselected area of the racket head to leave a desired area of the strings exposed for striking a ball in a conventional manner.

3,820,786
A METHOD FOR PLAYING STRATEGY GOLF
James T. Candor, 5440 Cynthia Ln., Washington Township, Ohio 45429
Continuation-in-part of Ser. No. 220,045, Jan. 24, 1972, abandoned. This application Nov. 20, 1972, Ser. No. 307,977
Int. Cl. A63b *67/02*
U.S. Cl. 273—32 R **2 Claims**



A method of playing strategy golf involving the use of a book or kit for laying out in simulation form one or more holes of golf for the purpose of studying and then subsequently playing each such hole for the minimum score for the golfer's ability wherein each simulated hole is provided by a page of said book and comprises a first sheet having markings thereon to

designate increments of distance from a golf green disposed thereon. A golf tee area is disposed on the first sheet at a preselected distance from the green and hazards and landmarks are also disposed on the first sheet between the tee area and the golf green to simulate the hazards and landmarks the golfer might encounter when playing that particular hole of golf. A smaller, transparent sheet having markings designating increments of distance from a point on the smaller sheet is disposed on the first sheet with the point of the smaller sheet at the golf tee area and with its incremental markings being directed in a desired direction toward the golf green. Each assembled page can be detachably secured in a notebook-like cover to be protected thereby during the use thereof.

3,820,787

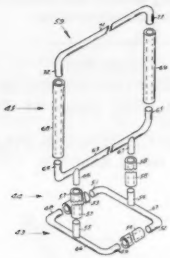
FOOTBALL PRACTICE TARGET

Leonard F. Heinbigner, 934 Pierce Ave., Oshkosh, Wis. 54901

Continuation-in-part of Ser. No. 15,072, Feb. 27, 1970, abandoned. This application Feb. 11, 1972, Ser. No. 225,561

Int. Cl. A63b *67/00*

U.S. Cl. 273—55 B **1 Claim**



A flexible bag having its mouth end portion secured to a rim for retaining the bag in open mouth position, said rim being disposed in a vertical plane and mounted on resilient support means for rotation about a vertical axis and for movement vertically, and avoid excess package pollution, said rim being comprised of a pair of substantially identical U-shaped rodular members, the U-shaped members being secured together by a pair of substantially identical tubular members telescopically receiving the legs of the U-shaped members in a press fit manner to form a substantially rectangular frame, said frame having a rectangular base also being formed from a pair of U-shaped rods joined by a pair of tubular members, said base and said frame being joined together by a pair of tubular members receiving rods extending from said base and said frame, said frame being supported in a vertical plane and being substantially perpendicular to said base.

3,820,788

UP-HILL TOY RACING GAME

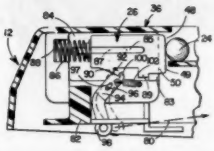
Adolph E. Goldfarb, 4614 Monaraca Dr., Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Dr., Encino, Calif. 91316

Filed Feb. 21, 1973, Ser. No. 334,220

Int. Cl. A63f *9/14*

U.S. Cl. 273—86 D **2 Claims**

A competitive racing game apparatus comprising a board having at least two upwardly inclined tracks, racing pieces such as motorcycle figures each movable along one of the tracks, and individual impact-propelling mechanisms associated with each of the tracks and operable selectively and independently from the other impact-propelling mechanisms for effecting incremental movement of the associated racing piece upwardly along its track. Each of the illustrated impact-propelling mechanisms comprises an impact ball and a manually actuating propelling mechanism which propels the ball up along the associated track to impact its racing piece and thereby advance it along the track. After each impact, the



ball rolls back down its track to the propelling mechanism for a subsequent shot. Mechanisms to indicate the start of the race and the finish of the race by the winner may also be provided.

3,820,789

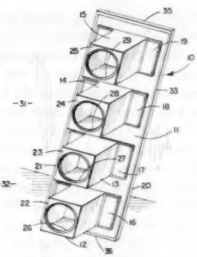
COLOR CODED POCKETED TARGET PROJECTILES AND SCORING INDICIA

Juliette T. Dudley, 724 First St., Apt. 6, San Pedro, Calif. 90731

Filed Oct. 17, 1972, Ser. No. 298,399

Int. Cl. A63b *71/02*

U.S. Cl. 273—95 R **3 Claims**



An educational game device including a plurality of discrete target elements of different colors, each having an opening leading to a receptacle, a plurality of sets of balls adapted to enter the openings in the target elements, the sets of balls being of colors corresponding to those of the target elements, and a plurality of sets of objects contoured to the shapes of arabic numbers, the sets of numbers being of colors corresponding to those of the target elements and sets of balls.

3,820,790

VEHICLE FOR PLAYING A BALL GAME

Gerald Wallace Peterson, 2117 Placid, Carrollton, Tex. 75006

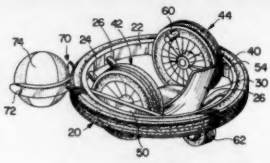
Filed Sept. 27, 1972, Ser. No. 292,522

Int. Cl. A63b *71/00*

U.S. Cl. 273—129 **17 Claims**

A vehicle for enabling a player to participate in a soccer-like ball game is provided. The vehicle comprises a frame, a plurality of wheels mounted on the frame, means for driving at least one of the wheels to propel the vehicle and a ball carrier mounted on the frame for engaging and rolling a ball as the

vehicle is propelled. In a preferred embodiment the ball carrier is mounted for reciprocation in a substantially horizontal



direction relative to the frame, and a pedal is connected to the ball carrier to permit the player to reciprocate the ball carrier by actuating the pedal to strike the ball.

3,820,791

BOARD GAME

William T. Powers, Northbrook, Ill., assignor to Aladdin Industries, Nashville, Tenn.

Filed Oct. 12, 1972, Ser. No. 296,949

Int. Cl. A63f *3/00*

U.S. Cl. 273—131 B **11 Claims**

A board game comprising a playing board having a flat surface marked in a grid pattern to form discrete areas. A plurality of flat playing tiles, dimensionally corresponding to the discrete areas are placed on the surface of the board by the players along with one start and one home tile for each player. Eacy playing tile has a different set of direction vectors on its exposed surface so that after the players have placed all the playing tiles on the board surface, a playing surface consisting of the direction vectors is presented. Each player is provided with a transparent playing piece which at the beginning of the game is placed on the player's home tile. Play commences with one player moving his playing piece to a playing tile so that the direction vectors on that playing tile may be viewed through the playing piece. The opponent may then move his playing piece to a playing tile in any of the directions indicated by the vectors so viewed. The other player may then move his playing piece in a similar fashion. Play continues until one of the players moves onto his own home tile at which time that player wins the game.

3,820,792

DICE SHAKER HAVING A PLURALITY OF INDIVIDUAL DICE CHANNELS INCORPORATED THEREIN

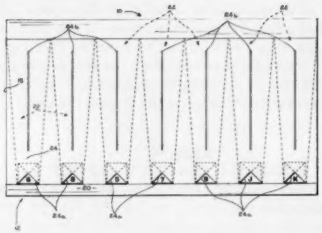
William E. Woodall, Jr., 1012 Indian Trails, Raleigh, N.C. 27609

Filed May 31, 1973, Ser. No. 365,730

Int. Cl. A63f *9/04*

U.S. Cl. 273—145 C **4 Claims**

The present invention relates to a dice shaker having a plurality of dice channels secured within a hand shaker frame assembly. Each die channel is normally disposed at an inclined angle within the hand shaker assembly and includes a multiface die confined therein with each die face having multiple sets of indicia inscribed thereon. Also, each die channel has an outer wall structure that generally tapers inwardly toward the lower end thereof to such a degree that the lower end is only slightly greater in cross section than the individual die contained therein. Therefore, because of the inclined position of the dice channels, the individual die in each channel tends to gravitate to the bottom of the dice channel and assume a rest position thereat. In the vicinity of the lower end of each die



channel is formed an opening which has an area less than the area of a die face and approximately equal to the area occupied by each set of indicia inscribed on each die face. The registering of this opening in each die channel with a particular set of indicia establishes a result or value.

3,820,793

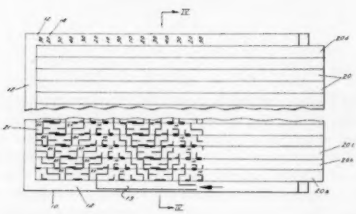
LABYRINTH GAME WITH CHANGEABLE PATTERN

Donnally W. Palmer, 3462 Goodwood Dr., S.E., Grand Rapids, Mich. 49506

Filed Feb. 7, 1973, Ser. No. 330,317

Int. Cl. A63f *9/08*

U.S. Cl. 273—153 R **1 Claim**



An amusement device providing a changeable labyrinth or maze pattern comprising a plurality of elongated movable elements arranged in side-by-side relationship in a tray. Each of the elements has indicia thereon and the indicia on the elements collectively form a maze pattern which, in almost all arrangements of the elements has at least one unobstructed pathway from one side edge of the elements to the other. The elements may have additional indicia which score successful completion of a transit through the maze.

3,820,794

GOLF TRAINING DEVICE

Katsumi Inoue, Tokyo, Japan, assignor to Teipi Service & Sales Corporation, Tokyo, Japan

Filed Feb. 12, 1973, Ser. No. 331,345

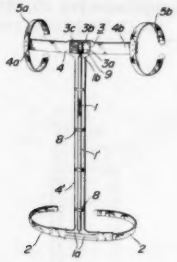
Claims priority, application Japan, Mar. 2, 1972, 47-21048

Int. Cl. A63b *69/36*

U.S. Cl. 273—183 B **7 Claims**

A golf training device which is useful for correct judgement of the degree of twisting of a golfer's body and comprises a rod one end of which is attached to the lower back portion of the golfer's body and turned by the twisting of the body in the back swing, a band to fit said rod to said portion of the body, a sound producing mechanism which is attached to the other

end of said rod and produces sounds according to the degree of turning of said rod, a backing plate which holds said sound producing mechanism and transmits the turning of both shoulders to the device, and a pair of shoulder bands to fit said backing plate to both shoulder joints of the golfer. A ratchet mechanism may be included in the device, whereby the sounds will be produced only during the golfer's backswing.



3,820,795

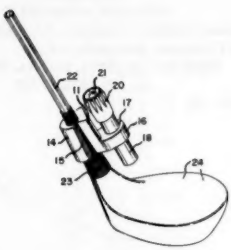
GOLF SWING TRAINING DEVICE

David L. Taylor, 380 W. Carmel Valley Rd., Carmel Valley, Calif. 93924

Filed Aug. 9, 1973, Ser. No. 387,003

Int. Cl. A63b *69/36*

U.S. Cl. 273—186 A **2 Claims**



The invention relates to a unit which is readily attached to and detached from a golf club shaft to provide a visual self-analysis of one's own golf swing. It consists of a golf club having removably secured to its hosel a snap fitting attachment carrying a light source directing a light beam upwardly, a hosel entrance opening on said attachment is positioned on the rearward side of said hosel.

3,820,796

TWO-CHANNEL AND FOUR-CHANNEL AUTO-SELECTOR DEVICE FOR CARTRIDGE-TYPE TAPE PLAYERS

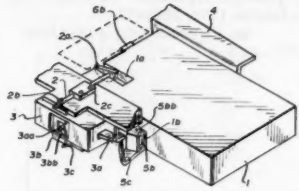
Kumeo Tahara, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

Filed Sept. 29, 1972, Ser. No. 293,553

Int. Cl. G11b *21/12, 15/12, 21/08*

U.S. Cl. 360—94 **6 Claims**

This invention relates to a two-channel and four-channel auto-selector device for a cartridge-type tape player, that is, to a device which selects and actuates a two-channel circuit or a four-channel circuit in a tape player in response to detection of the type of tape cartridge inserted in the player, as to whether it is the two-channel type or the four-channel type. The player has an auto-selector device which is responsive to the physical characteristic of the cartridge inserted therein to operate a mode selector switch rather than having the cartridge operate the mode selector switch directly.



3,820,797

PHONOGRAPH RECORD CHANGER

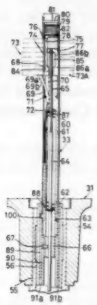
Norihiro Suzuki, Saitama-ken, and Kazuyuki Takizawa, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 22, 1971, Ser. No. 191,765

Claims priority, application Japan, Oct. 24, 1970, 45-93656

Int. Cl. G11b *17/16*

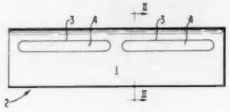
U.S. Cl. 274—10 S **21 Claims**



In a phonograph record changer having a spindle assembly for supporting a stack of records at an elevated storage position above the path of the tone arm in moving across the turntable; record changing is accomplished by the controlled movement of the lowest record in the stack, preferably with any other records in the stack, to an intermediate position which is spaced from the elevated storage position by at least substantially one-half of the distance from the elevated storage position to the turntable surface, whereupon the lowest record is released to drop onto the turntable from a relatively short distance thereabove for avoiding damage to the records. During record changing, rotation of the turntable is temporarily halted while the turntable motor continues to operate for rapid return to normal turntable speed at the conclusion of a record changing cycle. The record changer further permits repeat playing of any selected record in the stack, or, if desired, the shutting-off of the record changer at the completion of the play of a record on the turntable even though one or more records remain on the spindle.

3,820,798
SEALING BAR FOR A ROTARY PISTON INTERNAL COMBUSTION ENGINE

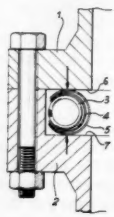
Heinz Lamm, Bernhardt, Germany, assignor to Daimler-Benz AG, Stuttgart-Unterurkheim, Germany

Filed Nov. 20, 1970, Ser. No. 91,365
Claims priority, application Germany, Nov. 21, 1969, 1958506; Feb. 24, 1970, 2008473
Int. Cl. F02b *55/02;* **F16j** *15/08*
U.S. Cl. 277—81 P **6 Claims**

A sealing bar for a rotary piston internal combustion engine, especially of trochoidal construction which is arranged movable in the radial direction within a piston groove and which sealingly slides with its crest portion along an engaging surface provided in the housing casing of the internal combustion engine, whereby the flanks of the sealing bar are provided either entirely or partly with separate sliding elements which in conjunction with the material of the piston result in small friction values; small recesses may additionally be provided in the flanks of the sealing bar within the area of the sliding element for the accommodation of a connecting material for the sliding element with the sealing bar.

3,820,799
RESILIENT METAL GASKET

Claud Abbes, St-Etienne; Santos Bianchi, Bourg-St-Andeol; Roger Chevallereau, Bollene; Maurice Moreau, LaPalud; Jean Rogemont, St-Etienne; Robert Roques, Pont-St-Esprit; Christian Rouaud, Pierrelatte, and Henri Royer, Orange, all of France, assignors to Commissariat al'Energie Atomique, Paris, France

Filed Aug. 16, 1972, Ser. No. 280,952
Int. Cl. F16j *15/00, 9/06;* **F02f** *5/00*
U.S. Cl. 277—164 **7 Claims**

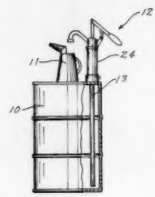


The invention relates to a resilient metal gasket which has outstanding crushing and residual resilience properties. The gasket comprises a central core formed by a metal wire helical spring which is closed on itself and is toroidal in shape in the inoperative state. The spring is enclosed by a first resilient hard metal envelope which in turn is enclosed by a second independent envelope of a ductile metal. The two envelopes enclosing the spring both have the form of a toroidal surface whose generating circle includes a gap. The helical spring has continuous turns and its ends may be joined together by a short connecting element such as a second spring.

3,820,800
PUMP BASE ASSEMBLY

Chester Dorn, Spencer, Iowa, assignor to Superior Manufacturing Company, Spencer, Iowa

Division of Ser. No. 175,263, Aug. 26, 1971, Pat. No. 3,743,448. This application Feb. 20, 1973, Ser. No. 333,885
Int. Cl. F16j *15/00, 11/06*
U.S. Cl. 277—237 **1 Claim**

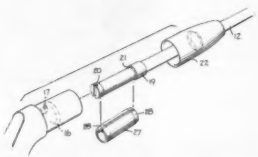


A pump base assembly for connecting a pump cylinder and a container for fluid to be pumped including a unitary body member adapted to receive and clamp the pump cylinder, a check valve carried by the body member, and sealing means providing a fluid-tight seal between the body member and the pump cylinder received in the body member. A resilient, ring type sealing means is disclosed which has two annular segments joined throughout their circumference, one of the annular segments being adapted to be urged against the inner lower wall surface of a cylinder received in the body member.

3,820,801
COLLET ASSEMBLY

James Monroe Lindler, Lexington, S.C., assignor to Columbia Products Company, Columbia, S.C.

Filed Nov. 26, 1971, Ser. No. 202,233
Int. Cl. A01k *87/02*
U.S. Cl. 279—48 **6 Claims**



The fishing rod blade is provided with an annular recess to receive the split plastic collet while the foregrip and handle bores are sized to abut the ends of the collet to secure the collet and blade in place. The collet has tapered ends to facilitate circumferential squeezing of the collet as the foregrip is threaded onto the handle.

3,820,802
SKI-ADAPTER COMBINATION, FOR FREE-STYLE MANEUVERING

Lon R. Davis, 11116 Cumpston St., North Hollywood, Calif. 91601

Filed May 17, 1972, Ser. No. 254,249
Int. Cl. A63c *5/00*
U.S. Cl. 280—11.13 T **6 Claims**

A ski adapter or attachment is disclosed for use on the trailing edges of snow skis so as to provide up-turned tips at both ends of a ski, to facilitate the performance of free-style maneuvers. An arcuate rigid attachment or form is provided

for mating engagement with the trailing edge of a ski to provide a continuous surface termination extending upwardly

from the bottom or running surface of the ski. As disclosed, a fastening structure is provided for releasably affixing the form to a ski.

3,820,803
TOE-OR HEEL-HOLDING DEVICE FOR SAFETY SKI BINDINGS

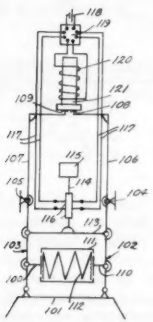
Hans-Otto Frisch, and Bernd Payrhammer, both of Farchant, Germany, assignors to Hannes Marker, Garmisch-Partenkirchen, Germany

Continuation-in-part of Ser. No. 38,053, May 18, 1970, Pat. No. 3,692,322. This application Jan. 17, 1972, Ser. No. 218,371

Claims priority, application Germany, July 4, 1969, 1934060

Int. Cl. A63c 9/08

U.S. Cl. 280—11.35 M **11 Claims**



A toe-or heel-holding device for safety ski bindings having a soleholder member and means in operative relationship with the soleholder member for resisting movement by the soleholder member relative to the ski and wherein the resistance means inc'ude an electric-electronic, hydraulic, or friction clutch automatic control system.

3,820,804
SKI BINDING

Wolfgang Benner, Landsiedlerstrasse, 7184 Kirchberg/Jagst, Germany

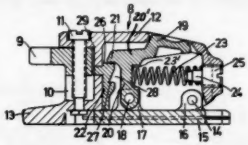
Filed July 17, 1972, Ser. No. 272,447

Claims priority, application Germany, July 17, 1971, 2135808

Int. Cl. A63c 9/08

U.S. Cl. 280—11.35 T **14 Claims**

A ski binding heel unit having a housing and a release lever pivotable relative to a ski base plate and each other. The release lever has an upwardly directed portion with a forwardly extending nose thereon engageable with a pair of faces on the housing. An adjustable compression spring between a rear housing wall and the upwardly directed portion urges the



nose of the release lever into engagement with one of two abutment faces on the housing. A rearwardly extending portion is positioned beneath an opening in the housing for actuation of the ski binding.

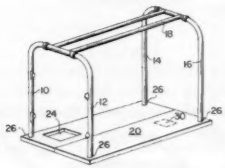
3,820,805
CONVERTIBLE ICE HOUSE-SNOW SLED COMBINATION

Matt E. Tuomala, 515 First St., Nashwauk, Minn. 55769

Filed June 19, 1972, Ser. No. 263,758

Int. Cl. B62b 1/16

U.S. Cl. 280—12 S **10 Claims**



A kit assembly for a combination ice house and snow sled enables rapid construction of either or conversion of one from the other with a minimum of left over parts and without the use of bolts and the like. The assembly includes two pairs of runners which are used to construct the framework of the ice house, one pair also being used as the sled runners. A hinged two-section floor for the ice house is folded together to form a seat for the sled. The sled also includes H-shaped standards the lower ends of which are received in sockets or sleeves welded to the runners and the upper ends of which extend through aligned apertures in the seat. A carrying compartment for the sled is formed by end and side panels the latter of which include brackets through which the upper ends of the standards extend.

3,820,806
SLED-RAMP

Benjamin W. Cline, 308 N. Felts Rd., and Larry D. Prophet, 12109 E. 26th St., both of Spokane, Wash. 99206

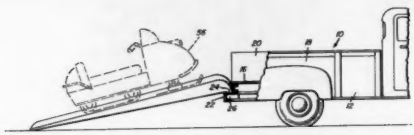
Filed Sept. 15, 1972, Ser. No. 289,360

Int. Cl. B60p 1/44

U.S. Cl. 280—30 **7 Claims**

A sled construction including a deck and opposite side depending longitudinal runners. The deck includes front and rear ends and the forward end thereof curves upwardly through an arc of decreasing radius and slightly more than 90°. The sled includes opposite side upwardly projecting longitudinal side walls which are slightly forwardly and upwardly inclined and terminate at their forward ends in forwardly and upwardly angulated surfaces inclined approximately 45° relative to the deck, the upper extremities of the inclined surfaces

being disposed at least closely adjacent the upper extremity of the forwardly and upwardly curving forward end of the deck. The upwardly curving forward end of the deck functions to plane the sled over snow behind a towing vehicle such as a snowmobile and the sled may be inverted with the free end of the curved forward end portion of the deck and the angulated forward extremities of the sides hooked over the bumper of a



load vehicle such as a pickup truck to thus enable a snowmobile to be advanced forwardly up over the inverted sled onto the load bed of the pickup truck with the inverted sled functioning as a ramp and the runners extending along the opposite sides of the ramp defining curbs to prevent a snowmobile from slipping sideways off the ramp defined by the inverted sled.

3,820,807

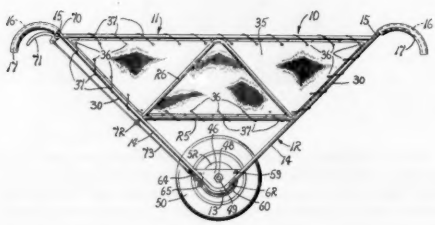
CART

Thomas W. Curran, 3006 Crest Dr., Bakersfield, Calif. 93306

Filed Jan. 17, 1973, Ser. No. 324,431

Int. Cl. B62b *1/10*

U.S. Cl. 280—47.3 **5 Claims**



A cart for the transport of a work load over rough terrain, the cart having a frame with downwardly convengent congruent sides providing adjacent lower ends; cross bars interconnecting the sides so as to form downwardly convergent opposite ends for the cart; a ground engaging wheel mounted for rotation between the lower ends of the sides; and handles oppositely extended from the ends for the exertion of directional control and balance of the cart.

3,820,808

STAIR HOLDING DEVICE FOR VACUUM CLEANER

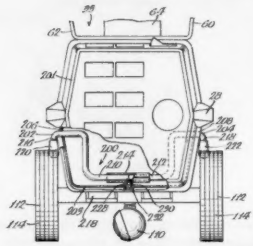
Elmer Eugene Brunning, Normal; Donald P. Grover, Naperville; Manfred Schild, Berwyn, and Robert William Nickelson, Elk Grove Village, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed May 14, 1973, Ser. No. 359,712

Int. Cl. B62d *21/00;* **B60t** *1/04*

U.S. Cl. 280—80 R **16 Claims**

A mechanism for holding a canister or tank-type vacuum cleaner in an upwardly inclined position on a stairway is disclosed. A pendum-like lock crank passes through the lower interior of the housing of the cleaner and has a pair of downwardly bent locking arms extending outside of the housing. A resilient protrusion is mounted on the bottom of the housing. When the lowermost portion of the lock crank is rotated forward of this protrusion, the mechanism is retained in a disengaged position. When the lowermost portion of the lock crank is rotated rearward of the protrusion, the pendulum action of the lock crank positions the locking arms in con-



tact with the rear wheels of the cleaner such that they can engage so as to lock the vacuum cleaner on the stairway when the front end of the cleaner is at a higher level than the rear end.

3,820,809

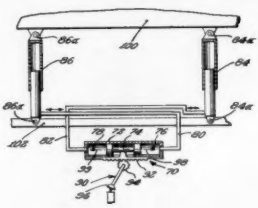
BODY TILTING MECHANISM

James A. Blonar, Barrington, Ill.

Division of Ser. No. 57,506, July 23, 1970, Pat. No. 3,689,108. This application June 5, 1972, Ser. No. 259,499

Int. Cl. B62d *9/02*

U.S. Cl. 280—91 **2 Claims**



External forces acting upon a vehicle during movement along a curve or turn are counteracted and provide body banking by a body tilting or banking mechanism comprising a means for counteracting the external tipping forces which means may include an inclined plane, or matching inclined plane members having a common axis so that movement of one with respect to the other will cause a tilt of the vehicle in the direction opposite that caused by the external tilting force. This means may be conveniently positioned and, for example, connected with the steering control of a vehicle or in a hinged vehicle such as a semi-trailer, it may be made a part of the interchange coupling between tractor and trailer. The means may include an inclined plane bearing against a movable axle means and may take the form of a hydraulic means operated off of a master cylinder.

3,820,810

WHEEL SUSPENSION SEALING

Lennart Birger Valentin Johnsson, Nodinge, Sweden, assignor to Aktiebolaget Volvo, Goteborg, Sweden

Filed Sept. 7, 1972, Ser. No. 287,039

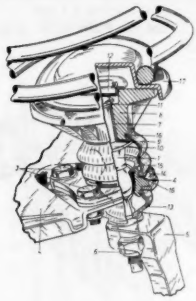
Claims priority, application Sweden, Sept. 8, 1971, 11373/71

Int. Cl. B60g *7/02*

U.S. Cl. 280—96.2 **10 Claims**

A sealing for joints in wheel suspensions, in particular for joints in springing suspensions for the front wheels of motor

vehicles in which the upper bearing for the steering swivel comprises a trunnion which is substantially vertically carried in the lower spring attachment and which has its lower end attached to the steering swivel. The upper outer link arm end is carried by means of a ball joint at the central portion of the



trunnion. The sealing comprises a sealing ring arranged about the trunnion and the lower attachment of the ring comprises the bearing box of the ball joint and the upper attachment of the sealing ring comprises the lower spring attachment. The sealing ring may be shaped as a bellows and be manufactured from rubber.

3,820,811

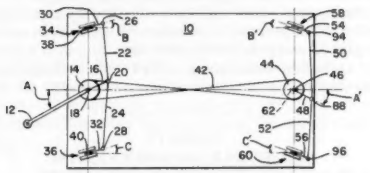
SELF-TRACKING INDUSTRIAL TRAILER

Sidney D. Lapham, 2324 Tice Creek Dr., Manor No. 3, Walnut Creek, Calif. 94595

Filed Oct. 13, 1972, Ser. No. 297,481

Int. Cl. B62d *13/04*

U.S. Cl. 280—99 **6 Claims**



A double-steered warehousing trailer is disclosed which is capable of tracking a tractor with a high degree of accuracy. Minor tracking errors can be corrected by a unique adjustability feature of the steering mechanism. The trailer is of simple construction, and it lends itself to being disassembled and reassembled for shipping and maintenance purposes without interfering with the factory adjustments of the steering mechanism.

3,820,812

VEHICLE SUSPENSION SYSTEMS

Peter William Robert Stubbs, Hampton Magna, and Stephen John Crouch, Coventry, both of England, assignors to The Rover Company Limited, Warwickshire, England

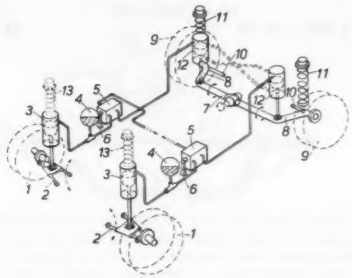
Filed July 10, 1972, Ser. No. 270,322

Claims priority, application Great Britain, July 9, 1971, 32303/71

Int. Cl. B60g *21/06*

U.S. Cl. 280—104 **5 Claims**

In an active anti-roll suspension control system for four-wheeled road vehicles of the kind employing variable-length hydraulic struts acting in series with the front springs and controlled by control units sensitive to lateral bodywork acceleration, the rear suspension is of a different kind, which may be orthodox, and anti-roll is applied at the rear by hydraulic cylinders acting on the rear suspension independently of the



rear springs, these cylinders being controlled by the control units for the corresponding front struts. The line of action of the rear cylinders may be such that they are unaffected by normal rear suspension movements, or the cylinders may be double-acting and diagonally cross-connected to avoid being affected.

3,820,813

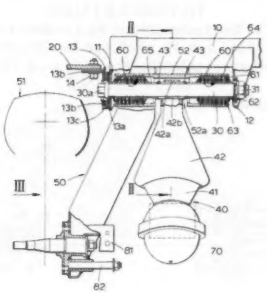
VEHICLE REAR WHEEL SUSPENSION ARRANGEMENT

Alexander Eric Moulton, and Anthony Best, both of Bradford-on-Avon, England, assignors to Moultan Developments Limited, Wiltshire, England

Filed Dec. 15, 1972, Ser. No. 315,578

Int. Cl. B60g *3/12*

U.S. Cl. 280—124 A **4 Claims**

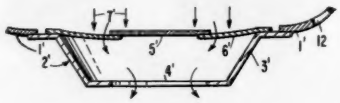


The invention relates to a rear wheel suspension system for a four wheeled automotive vehicle and provides an integrated sub-assembly which can be simply fitted in its entirety to the vehicle at a late stage of manufacture. The assembly includes hydraulic displacer units acting at high leverage on trailing type wheel supporting arms, the arrangement being such that the high loading generated by the displacers are largely absorbed within the sub-assembly. Means are provided for both locating the wheels and allowing a controlled degree of flexibility in such location. Means are also provided for insulating the suspension system from the sprung structure or body of the vehicle.

3,820,814
DISCHARGE VALVE FOR AN AIR BAG

Rudolf Allgaier, Nagold; Luigi Brambilla, Sindelfingen, and Hansjurgen Scholz, Echterdingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Apr. 3, 1972, Ser. No. 240,372
Claims priority, application Germany, Apr. 3, 1971, 2116347
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 AB 45 Claims

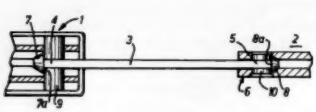


A discharge valve for an air bag serving as passenger protective device in vehicles, especially in motor vehicles, which is automatically inflated by means of a gas when exceeding a predetermined vehicle deceleration and which is also adapted to be emptied with a certain delay by way of the discharge valve; the latter is provided in the walls of the air bag and includes a cup-shaped housing with a discharge aperture arranged within its bottom area; a cover is associated with the discharge aperture which is retained by elastic elements, such as, elastic bands at a spacing upstream of the discharge aperture in relation to the direction of the discharge flow; the cover is adapted to be displaced in the direction toward the discharge aperture as a function of the gas pressure within the air bag against the return force of the elastic elements so as to control the effective area of the discharge aperture as a function of the gas pressure prevailing on the inside of the air bag.

3,820,815
CONNECTING DEVICE FOR ATTACHING SAFETY BELT TO VEHICLE FLOOR

Rene Noir, 17 Rue Louise-Michel 92, Levallois Perret, France

Filed Apr. 10, 1972, Ser. No. 242,644
Claims priority, application France, Apr. 8, 1971, 71.12472
Int. Cl. B60r *21/10*
U.S. Cl. 280—150 SB 11 Claims

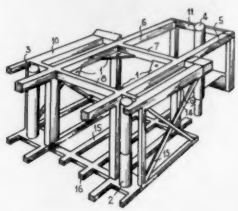


A connecting device for attaching a safety belt to the floor of motor vehicle comprises a steel bar of small cross section each end of which is provided with an enlarged head by cold upsetting. The head at one end of the bar is received in a socket of a coupling member of the belt and the head at the other end of the bar is received in a socket of an anchoring member secured to the vehicle floor. In one form, the socket comprises a cylindrical shaft having a diametral perforation through which the rod passes. Each head of the rod preferably has an annular flat bearing face which engages an anchoring face of the socket.

3,820,816
ANCHORING SYSTEM FOR A STRUCTURE CARRIED BY A VEHICLE SUPPORTING HEAVY BODIES

Lucien Neuers, Paris, France, assignor to Thomson-CSF, Paris, France

Filed June 9, 1972, Ser. No. 261,321
Claims priority, application France, June 11, 1971, 71.21333
Int. Cl. B20s *9/20*
U.S. Cl. 280—150.5 6 Claims



A vehicle which is intended to carry heavy movable bodies such as a radar turret or missile launching ramps, should be anchored to the ground so that a precise horizontality of the bodies is obtained. Although the vehicle itself is provided with an anchoring device, the stability and horizontality required are accomplished to a higher degree by providing the vehicle with a particular rigid structure having its own anchoring system independent of that of the vehicle.

This structure consists of an assembly of members substantially in the form of a cube having substantially vertical edges. The upper face of this cube is adapted to support on four points the heavy movable body. The particular anchoring system of the structure consists of three supporting members in the form of the hydraulic type jacks. Two of these jacks are fixed to two adjacent vertical edges of the cube and the third one to the vertical face opposite these vertical edges.

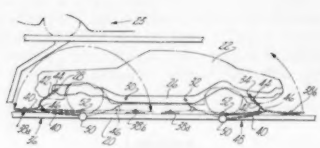
Furthermore a better rigidity is obtained by extending the structure to the external dimensions of the vehicle and reinforcing the lateral panels of the structure.

The anchoring jacks are provided with locking jaws for holding them stationary at any point of their travel.

3,820,817
ADJUSTABLE TIE DOWN SYSTEM

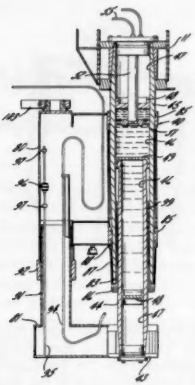
Billy E. Harold, 6869 Oldham, Taylor, Mich. 48180

Filed Aug. 27, 1973, Ser. No. 391,939
Int. Cl. B60p *7/00*
U.S. Cl. 280—179 A 15 Claims



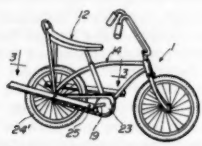
A tie down system for securing a vehicle such as an automobile to a carrier for transport. The vehicle body is attached at four locations by adjustable chain means in which the chain attachment members are simply and adjustably movable one link at a time to make provision for attachment of different length, height and width vehicles without requiring extensive adjustment to adapt to the different sizes. An intermediate collar is employed to adjust the position and thus the angle of the attachment chain with respect to the substantially horizontal track on which the vehicle is mounted on the carrier.

3,820,818
STEERING AND SUSPENSION FOR HIGH CAPACITY VEHICLES
Edward S. Kress; Ralph H. Kress, both of Box 368, and Jackson C. Medley, Box 322, all of Brimfield, Ill. 61517
Filed May 12, 1972, Ser. No. 252,713
Int. Cl. B62d *7/18*
U.S. Cl. 280—96.2 R **6 Claims**



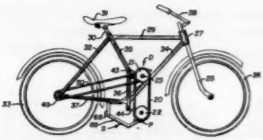
A combined suspension and steering system for a large bulk carrier is provided. A modified Ackerman steering gear allows the vehicle wheels to be pivoted up to 90° so that the vehicle can be turned around in approximately twice its own length. The steering knuckle arms are connected to the front suspension cylinders of the carrier and house wheel brake lines, suspension travel limit switches, and associated apparatus. An adjustable vehicle suspension includes hydro-pneumatic cylinders. Each of these cylinders has a center chamber containing a variable amount of incompressible fluid and adjacent end chambers containing a fixed amount of compressible fluids. Associated hydraulic and electrical circuitry include a self-leveling feature which may be manually over-ridden to lower or raise the vehicle body upon command. In an alternate embodiment, the suspension cylinders may be constructed to provide this self-leveling feature without the use of electrical circuitry.

3,820,819
BICYCLE ACCESSORY
John C. Ivkovich, 12406 S. Emerald Ave., Chicago, Ill. 60628, and Philip Billiteri, 7829 Central Ave., Morton Grove, Ill. 60053
Filed Oct. 10, 1972, Ser. No. 296,299
Int. Cl. B62m *1/00*
U.S. Cl. 280—231 **2 Claims**



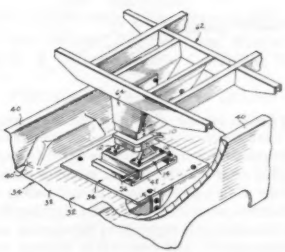
An accessory for a bicycle for allowing a second person rider to assist the first person in propelling the rear or driving wheel of a bicycle by employing a rearward extension of the foot pedals supported by a roller, and a framework secured to the rear axle of the bicycle.

3,820,820
PEDAL DRIVE
John E. Kutz, 960 S. Pierce St., Lakewood, Colo. 80226
Filed Apr. 3, 1972, Ser. No. 240,548
Int. Cl. B62m *1/00*
U.S. Cl. 280—252 **7 Claims**



A pedal drive for a bicycle or the like having each pedal mounted upon an individual chain which defines a pedal path selected to produce a more effective thrust during a major portion of the downward movement of each pedal. The pedal chains, a matched pair, move along upright, generally oblong paths between upper and lower sprockets. The corresponding sprockets for each pair of chains are carried upon common shafts, while the pedals are attached to the chains to move in opposition. Each pedal cantilevers from its chain, and to prevent tipping movement at the chain, articulated stabilizer arms are pivotally secured to the frame and pivotally connect with the pedals. This pedal drive is connected to the rear wheel of the bicycle by various sprocket and chain arrangements.

3,820,821
REMOVABLE FIFTH WHEEL HITCH
Chester W. Leland, Centreville, Mich., assignor to Leland Engineering, Inc., White Pigeon, Mich.
Filed June 11, 1973, Ser. No. 368,734
Int. Cl. B62d *53/08*
U.S. Cl. 280—423 R **5 Claims**

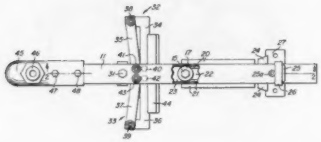


A fifth wheel hitch in which a kingpin lock and bearing plate is pivotally supported upon a coupler plate which is removably attached by sliding cooperation with a mounting bracket connected to the bed of a pickup truck or similar towing vehicle.

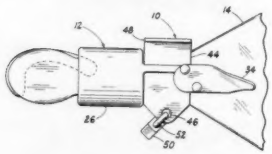
3,820,822
TOW HITCH
Charles R. Henderson, 255 W. 1st South, Vernal, Utah 84078
Filed May 29, 1973, Ser. No. 364,944
Int. Cl. B60d *1/00*
U.S. Cl. 280—478 A **10 Claims**

A two hitch adapted to be extended longitudinally and laterally for attachment conveniently to a towing vehicle

which is not in linear alignment with the hitch, has a pair of elongate bars extending horizontally in the same plane having respective mutually confronting longitudinal surfaces. The surfaces are pivotally connected together by pivot means which is mounted for sliding along at least one of the mutually confronting surfaces, and by a pair of cooperating scissor hinges, each extending laterally from respective sides of the elongate members. One end of each hinge is pivotally connected to one of the elongate members, and the other end of each hinge is pivotally connected to the other elongate member. The hitch has appropriate retaining and securing means at each end thereof for preventing the relative lateral movement of the elongate bars when the tow hitch is in use. Means are also provided at opposite ends of the two elongate bars for securing the respective hitch ends to a trailer or the like and to a towing vehicle.



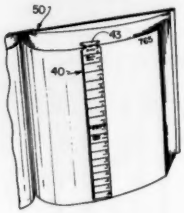
3,820,823
LOCKING DEVICE FOR TRAILER HITCHES
Bud A. Beaston, Rt. 1 Box 13, Sperry, Okla. 74073
Filed Jan. 11, 1973, Ser. No. 322,740
Int. Cl. B60d *1/06*
U.S. Cl. 280—512 **2 Claims**



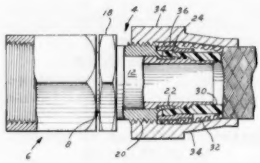
A locking device for use with trailer hitches having sliding-sleeve type latch mechanisms disposed at the forward end of the trailer tongue member, the locking device comprising slot means provided on the trailer tongue member adjacent to the rear edge of the sliding-sleeve when the said sliding-sleeve is in its forward latched position, a stop plate is engagable with the rear edge of the sliding-sleeve thereby preventing retraction of the said sliding-sleeve, and removable retainer means provided on the stop plate to prevent removal of the said stop plate from the said slot means.

3,820,824
DICTIONARY INDEX
James F. Maxwell, 3507 Lakewood Dr., Norfolk, Va. 23509
Continuation-in-part of Ser. No. 298,373, Oct. 17, 1972, abandoned. This application July 30, 1973, Ser. No. 383,468
Int. Cl. B42d *15/00*
U.S. Cl. 283—36 **8 Claims**

An index for aiding location of a word in alphabetical sequence in a dictionary includes a table for each letter, each table having five columns. The first three columns list all combinations of first three letter groups in the sequence, the first two columns being blank except where a second letter change occurs. The fourth column gives the number of the page on which words having each three letter group commence, and the fifth column contains symbols identifying the quadrant on that page where the group commences. Also disclosed is a kit for modification of an existing book to provide it with index pages, the pages being attachable in the book as by adhesive. In a further embodiment a calibrated margin guide is used with the index, the guide having a tab for providing alignment with the top of the page and calibrations further subdividing top and bottom halves, the guide being movable laterally to serve all quadrants. The index is then provided with a sixth column having a number from 1 to 9 indicating subdivision. A fourth letter guide to be provided at the bottoms of pages is also disclosed. The fourth letters are also printed in the left margin of each column of words, in alphabetical order in front of the words representing the first ones of fourth-letter groups, and below the third letter marker in that same column.



3,820,825
FLEXIBLE HOSE COUPLING AND SWIVEL NUT CONNECTOR ASSEMBLY
Louis F. Morin, Springfield, Mass., assignor to Everflex Products, Inc., Ludlow, Mass.
Filed Apr. 12, 1973, Ser. No. 350,057
Int. Cl. F16l *35/00*
U.S. Cl. 285—39 **4 Claims**

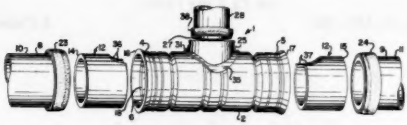


A flexible hose coupling having a two part nipple body and swivel connector nut assembly. The body includes, first, a tubular nipple stem formed with a flanged head at its outer end, an adjacent cylindrical neck portion, a reduced central portion extending therefrom which includes a shallow annular recess at the inner end of said portion, and a stepped hose insert portion. The inwardly flanged collar of a swivel nut is rotatably carried on the stem neck portion. The second part of the body is in the form of an outer tubular shell surrounding the central stem portion and anchored in abutting relation to the neck thus mounting the swivel nut between the head and shell. At the fore end of the shell is a flanged tool engaging surface, a hose socket-engaging threaded surface extending therefrom, and an inner shell end in the form of a thin cylindrical skirt deformed and locked into said annular recess to form a unitary body.

3,820,826
FITTING STRUCTURE FOR PIPE

Elmer R. Ligon, and Paul B. Friley, both of Pittsburg, Kans., assignors to W. S. Dickey Clay Manufacturing Company, Pittsburg, Kans.

Filed Jan. 19, 1972, Ser. No. 218,895
Int. Cl. F16l 9/14
U.S. Cl. 285—55 **13 Claims**

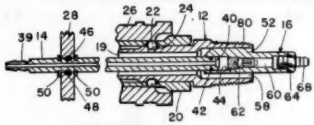


A fitting structure for joining pipe sections, particularly clay pipe, in at least two runs or lines of pipe and including an elongated shell or sleeve portion having aligned sockets in opposite ends thereof with each adapted to receive an end portion of a respective pipe section. The fitting has a branch portion communicating with the sleeve portion and extending laterally therefrom and having a socket therein adapted to receive an end portion of a pipe section. A tubular liner member preferably of clay is positioned within and in engagement with the portions of the sleeve portion and having an aperture therein for communicating the interior thereof with the branch portion. The sleeve portion and branch portion and respective pipe sections have cooperating members engageable to form a fluid tight seal between the fitting structure and the respective pipe sections.

3,820,827
QUICK DISCONNECT COUPLING FOR COAXIAL FLUID LINES

Wallace G. Boelkins, Grand Rapids, Mich., assignor to Uni-Mist, Inc., Grand Rapids, Mich.

Filed Feb. 2, 1972, Ser. No. 222,890
Int. Cl. F16l 47/00
U.S. Cl. 285—133 R **8 Claims**



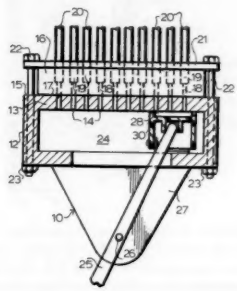
A co-axial quick disconnect coupling for coaxial fluid lines including an external plug-and-socket combination having an internal plug and socket mounted coaxially therein. Preferably, the internal plug member is mounted within the external socket portion of the connector while the internal socket is mounted within the external plug portion. Valves incorporated in the internal plug and socket prevent flow of the fluid in the coaxial line when the assembly is disconnected.

3,820,828
COMPACT MULTIPLE CONNECTOR APPARATUS FOR MULTIPLE CHANNELS AND TUBES

Theodore E. Fiddler, 1268 Suffield Dr., Birmingham, Mich. 48009

Filed Jan. 26, 1973, Ser. No. 326,839
Int. Cl. F16l 39/00
U.S. Cl. 285—137 R **10 Claims**

A compact apparatus for sealably interconnecting multiple aligned channels between the mating surfaces of two bodies wherein at least one body is relatively elastic and wherein multiple tubes lead to the channels of the elastic body with the I.D. size of the channels substantially the same as the I.D. size of the tubes thereby eliminating nipples which require tube I.D. size to be much larger than channel I.D. size. This allows the tubes and channels to be closely spaced and allows body size to be substantially reduced and in fact miniaturized. This also allows the use of small O.D. thin wall tubes without danger of rupture as when expanded over nipples. The tubes are bonded in the elastic body or sealed in counterbores of the elastic body by the radial movement of the elastic body against

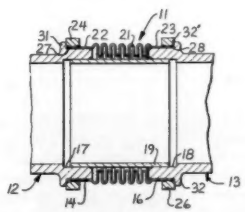


the tubes under the force exerted by a clamp plate to seal the tubes and channels in end-to-end communication. The mating surfaces of the bodies are sealed against one another under the force exerted by the clamp plate with the elastic body mating surface conforming to the surface of the other body to seal the tubes and/or their aligned channels in end-to-end communication. Tongue and groove interfitting, extending annular lips, mouths, heads and sockets, singly and in combination, at the mating surfaces of the bodies augment the seal at the mating surfaces of the bodies to seal the channels of the bodies in end-to-end communication.

3,820,829
COUPLING HAVING A SOLID LOCKING RING

Roland E. Hasselbacher, Brimfield, and Warren F. Budds, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 29, 1972, Ser. No. 284,487
Int. Cl. F16l 51/02
U.S. Cl. 285—226 **11 Claims**



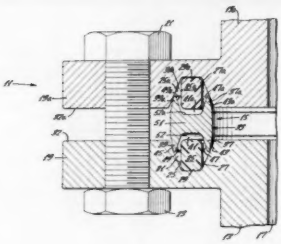
A flexible coupling for interconnecting tubular members having outwardly tapered ends includes a cylindrical member or bellows having an end portion in generally mating relation with the tapered end of each tubular member, a respective solid locking ring having a tapered inner surface being arranged to encircle each end of the bellows and being urged axially into locking engagement with the tapered tubular member.

3,820,830

CAPTIVE PLASTIC STATIC SEAL IN RING JOINT GROOVE

Eldon O. Dryer, Malibu, Calif., assignor to W. S. Shamban & Co., Los Angeles, Calif.

Filed Feb. 16, 1973, Ser. No. 333,167
Int. Cl. F16l *19/00*
U.S. Cl. 285—336 12 Claims



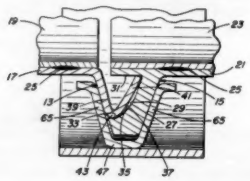
A sealing assembly including a retainer having first and second pairs of legs projecting axially thereof and defining first and second grooves, respectively. First and second seals of deformable sealing material are positioned in the first and second grooves, respectively. This sealing assembly is adapted for use between two members, such as pipes, which cooperate with the retainer to provide first and second completely enclosed cavities for the seals. The legs of the retainer are resiliently deformable and the legs of each pair are cammed toward each other by cooperation with cam surfaces on the first and second members. This assists in compressively loading the seals and assures that the seal cavities are completely closed to avoid extrusion of the seals.

3,820,831

COUPLING FOR CONNECTING ALIGNED TUBES

Joseph B. Swedelius, 1867 Sheridan Ave., San Diego, Calif. 92103

Filed Feb. 20, 1973, Ser. No. 333,763
Int. Cl. F16l *17/00*
U.S. Cl. 285—367 4 Claims



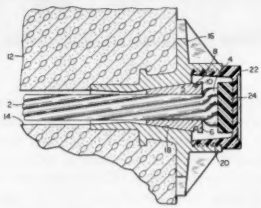
The coupling comprises two rings, one of the rings having a groove and the other ring including a section having a portion that extends into the groove. A clamp is employed for effecting a wedging between the two rings to provide a seal therebetween.

3,820,832

ANCHORING DEVICE FOR WIRE STRANDS IN PRESTRESSED CONCRETE STRUCTURES

Antonio Brandestini, 60, Alte Landstrasse, Kusnacht, Zurich; Hans Rudolf Siegwart, 11, Gartenstrasse, Kilchberg, Zurich, and Rene Kaser, 22, Pelikanstrasse, Wettingen, Aargau, all of Switzerland, assignors to said Antonio Brandestini by said Siegwart and said Kaser

Continuation-in-part of Ser. No. 806,571, March 12, 1969, abandoned. This application May 10, 1971, Ser. No. 141,674
Int. Cl. F16g *11/04*
U.S. Cl. 287—80 6 Claims



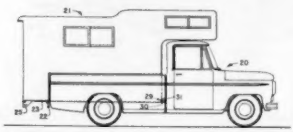
An anchoring device for wire strands in prestressed concrete structures wherein the end of the wire strand is upset to the shape of a head and the end portion of the strand together with the head is supported on the concrete structure by means of a clamping support inserted in a conical recess. The conical recess is provided in an anchor body embedded in the concrete structure and the clamping support is formed as a multipart wedging member supporting said head and inserted between the end portion of the strand and the conical wall of said recess to exert pressure on the end portion of the strand.

3,820,833

LATERALLY EXTENSIBLE BUMPER FOR A CAMPER BODY

John L. Margetts, 2182 Berkely, and George Philip Margetts, 3196 Mill Creek Rd., both of Salt Lake City, Utah 84109

Division of Ser. No. 809,252, March 21, 1969, Pat. No. 3,601,271. This application Apr. 26, 1971, Ser. No. 137,623
Int. Cl. B60p *3/32*; B60r *3/00, 19/04*
U.S. Cl. 293—63 3 Claims



A camper loading system wherein a single drive gear mounted on a truck bed is adapted to drive a pair of driven gears and their associated load gears or one of the driven gears and its load gear individually, to thereby drive the load gear or load gears in meshing engagement with racks on the bottom of a camper body; extensible front legs, pivoted on a support shaft fixed to a weight distributing mounting plate on the side wall of a camper body, are movable between a camper supporting position and a stowed position; wheel carrying rear legs are attachable to either the camper body or to an adjustable bumper secured to the camper body and are movable between an extended support position beneath the camper body and an easily accessible stowed position; and an easily released lock is provided to automatically secure the camper body against sliding off of the truck bed after it has been loaded thereon.

3,820,834

ARRANGEMENT OF BUMPER FOR VEHICLES

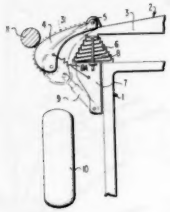
Karl Wilfert, Gerlingen-Waldstadt, and Bela Barenyi, Maichingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany

Filed Feb. 1, 1972, Ser. No. 222,567

Claims priority, application Germany, Feb. 2, 1971, 2104797

Int. Cl. B60r *19/08*

U.S. Cl. 293—75 33 Claims



An arrangement of a bumper for vehicles, especially for motor vehicles, which consists of three parts which are supported at the support frame of the vehicle by means of one or several springs; elements are provided between the support frame and the bumper which prestress these springs into an initial position corresponding to the normal position of the bumper.

3,820,835

BUMPER FOR MOTOR VEHICLES

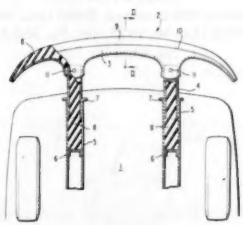
Karl Wilfert, Gerlingen-Waldstadt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Oct. 6, 1972, Ser. No. 295,488

Claims priority, application Germany, Oct. 9, 1971, 2150445

Int. Cl. B60r *19/08*

U.S. Cl. 293—88 17 Claims



A bumper for motor vehicles, especially passenger motor vehicles, which is automatically displaceable in the vehicle longitudinal direction under impact action; the back side of the bumper is thereby constructed approximately shell-shaped and equipped with at least two tubularly shaped extensions which are telescopically displaceable in associated fixed vehicle parts such as, for example, vehicle longitudinal bearers; the back side of the bumper is filled with an elastic material such as polyurethane foam which, on the one hand, covered with a rigid covering projects bulge-like forwardly over the edges of the back side and, on the other, extends through the extensions up to partition walls that subdivide the vehicle longitudinal bearers.

3,820,836

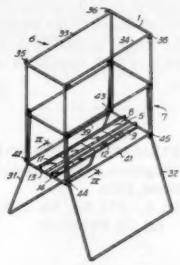
TENNIS BALL RETRIEVAL DEVICE

George L. Seewagen, and John A. Markisz, both of 579 W. 215th St., New York, N.Y. 10034

Filed Dec. 18, 1972, Ser. No. 316,057

Int. Cl. A01g *19/00*; A47f *13/06*

U.S. Cl. 294—19 A 6 Claims



A tennis ball retrieval device comprises a receptacle having an open top and a substantially open bottom for holding a plurality of tennis balls. An access arrangement normally in substantially horizontal planar position is provided in the bottom of the receptacle for admitting tennis balls into the receptacle and for preventing balls in the receptacle from falling out. The access arrangement comprises an access device yieldable under the pressure of a tennis ball in a direction into the receptacle to permit the entry of a tennis ball thereinto and instantly returnable to prevent the egress of a tennis ball from the receptacle.

3,820,837

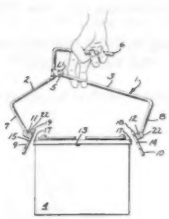
BATTERY CARRIER

Douglas E. Fredrickson, Elko, Minn., assignor to Modelko Tool Company, Elko, Minn.

Filed Aug. 27, 1973, Ser. No. 392,014

Int. Cl. B65g *7/12*

U.S. Cl. 294—63 B 1 Claim



Apparatus to aid manipulation of automotive batteries of the type having a rim around the top; a lever action apparatus with a short arm pivotally joined to a long arm to span the top of the battery, the short arm having an offset handle disposed above and adjacent to the long arm, each arm having at its outer end a shank reaching downward to the end faces of the battery, each shank having an inwardly facing clutch attached by a hinge, permitting rotation of the clutches to positions against the end faces of the battery, each clutch having an upper straight edge for engaging the lower margin of the rim of the battery. In use the apparatus is held by the handle in one hand of the operator, with fingers extended to the long arm to control the opening of the clutches to accommodate the length of the battery. Once the clutches are positioned against

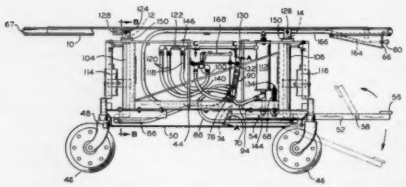
the rims, a lifting force applied at the handle results in a clutching force between the clutches of the apparatus and the battery is secure in the apparatus, to be carried by the handle in the hand of the operator. The considerable area of the clutches distributes the clutching force harmlessly over the battery end faces. To discharge a battery from the apparatus, the long arm is urged toward the handle, overcoming the clutching force, triggering the tripping of the clutches from their positions against the rims, and freeing the apparatus from the battery. A characteristic facile action of the apparatus in manipulating batteries is related to the hinged mounting of the clutches, wherein the trigger sensitivity is determined by the position of the hinge axes with respect to the upper straight edges of the clutches.

3,820,838

HYDRAULIC SYSTEM FOR WHEELED STRETCHERS

Paul D. Limpach, Napoleon, Ohio, assignor to Gendron-Diemer, Inc., Archbold, Ohio

Filed Oct. 6, 1972, Ser. No. 295,682
Int. Cl. B62b *3/02*
U.S. Cl. 296—20 **8 Claims**



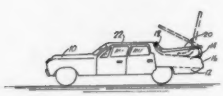
A hydraulically actuated wheeled stretcher wherein the patient supporting surface may be rapidly raised, tilted or lowered. The lowering operation is assisted by gas pressure from an accumulator into the upper portion of the lift cylinders.

3,820,839

AUTOMOBILE CONVERTIBLE EITHER TO SEDAN OR STATION WAGON

Hossien Molatalab, Toronto, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 6, 1973, Ser. No. 386,044
Int. Cl. B60j *7/04*
U.S. Cl. 296—99 **4 Claims**



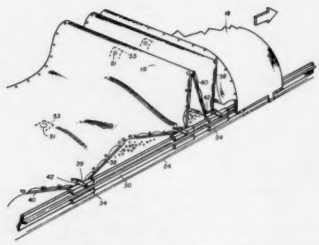
An automobile has a rear trunk assembly employing parallel vertical side walls and a rear wall hinged to a bottom deck whereby the rear wall can be swung to horizontally rearward position. A rear window and trunk hood section is releasable from rear and side walls. The section is pivotally secured to roller means which engage and are slidable along guide rails disposed along the side walls. In one position the section defines rear window and hood of a conventional sedan; in another position the hood forms a rear roof extension and the window is aligned with the rear wall to define a station wagon. Retractable side windows are carried by the side walls for cooperating with the roof extension in the sedan configuration.

3,820,840

TRUCK BODY COVER

Jason A. Forsberg, 7103 Rose Ave., Orlando, Fla. 32810

Filed Aug. 1, 1973, Ser. No. 384,625
Int. Cl. B60p *7/04*
U.S. Cl. 296—100 **9 Claims**



A truck body cover includes a flexible cover and two rails each mounted along the peripheral side of the truck body, with sliding members mounted on the rails. V-shaped spring members having arms attached to the cover are pivoted on the sliding members so as to accordion the cover when the members are drawn together and tension the cover along the peripheral side when the members are drawn apart.

3,820,841

CARPET SAVER

Hugh M. Andrews, 809 Florence, Royal Oak, Mich. 48067

Filed May 30, 1973, Ser. No. 365,108
Int. Cl. A47c *7/62*
U.S. Cl. 297—217 **10 Claims**

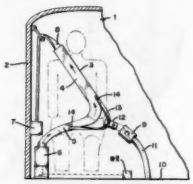
A carpet saver adjustably mounted to the underneath portion of the frame of a chair and the like which includes a tray and a rug slidably mounted to the tray for movement from a stored position beneath the chair to an in-use position beyond the front edge of the chair so that the feet of a person sitting in the chair rest upon the rug of the carpet saver instead of on the carpet upon which the chair rests to save the carpet from excessive wear. When the carpet saver is not in use, the rug is slid into a stored position on the tray beneath the chair, thus, concealing it from sight.

3,820,842

SLIP TONGUE WITH INFLATOR BAND

Robert L. Stephenson, Sterling Heights, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Nov. 17, 1972, Ser. No. 307,703
Int. Cl. A62b 35/00
U.S. Cl. 297—389 6 Claims



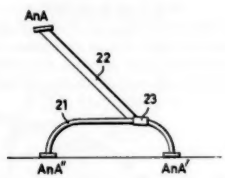
An inflatable band restraint system mounted to a strap structure which is in turn movably mounted on a tongue for reception in a buckle for positioning of the inflatable band restraint on an occupant.

3,820,843

WEBBING AND BELTING MEANS FOR USE IN SEAT BELTS

Kiyokazu Seo; Yoshihiro Hayashi, both of Toyota; Tunekichi Hoshino, and Fumiyoshi Masuda, both of Joetsu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken; Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi-ken and Hoshino Kogyo Kabushiki Kaisha, Niigata-ken, all of, Japan

Division of Ser. No. 236,749, March 21, 1972, Pat. No. 3,756,288. This application Dec. 18, 1972, Ser. No. 315,826
Int. Cl. A62p 35/00
U.S. Cl. 297—389 8 Claims



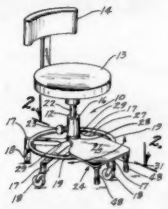
Weight belt restraining structure having a webbing with a multiple-step give. The webbing belts and the like having a multiple-step give. The webbing has a first warp of yarn of medium strength high tensility and has a second and third warp of yarn of low strength low tensility, medium strength medium tensility, on high strength low tensility as compared with the strength and tensility of the first warp. The weft is yarn of medium strength and high tensility. All of the warp yarns are sufficiently strong so they are not broken until the initial load applied to the webbing reaches a predetermined value between 200–1,000 kg, and the warp yarns also have sufficient strength not to elongate in proportion to an increase in load. Above the predetermined load value, the second and third warp yarns are gradually and repeatedly broken while the shape of the web is maintained by the first warp yarn and the weft until the tensility reaches a predetermined value after the initial load reaches such a value, after which the webbing elongates without an increase in the load applied thereto. The webbing does not return to its initial state with a violent recoil after removal of the load, due to the action of the first and second warps, thereby giving the webbing a multiple-step give with a load-deflection curve substantially in the form of a parallelogram.

3,820,844

STEP ATTACHMENT FOR A DENTAL STOOL

George A. Fortnam, Des Moines, Iowa, assignor to Den-Tal-Ez Mfg. Co., West Des Moines, Iowa

Filed Apr. 30, 1973, Ser. No. 355,764
Int. Cl. A47c 7/50
U.S. Cl. 297—432 4 Claims



The step attachment comprises a plate member adapted to extend radially from the center post of a dental stool in an overlying relation with the stool base, which carries floor engaging caster wheels. The plate member is movably supported at the lower end of the post for rotational movement about the post and for pivotal up and down movement of its outer end. A leg member at the outer end of the plate member is normally yieldably held out of engagement with the floor whereby the stool is freely movable along the floor and the plate member fully rotatable about the post. When the plate member is stepped on the leg member is moved into bearing engagement with the floor to hold the stool against floor movement.

3,820,845

SITTING FURNITURE

Eric Sigfrid Persson, Horby, Sweden, assignor to Expo Nord AB, Horby, Sweden

Filed Oct. 4, 1972, Ser. No. 294,860
Claims priority, application Sweden, Oct. 5, 1971, 12557/71; Dec. 14, 1971, 15974/71; Apr. 26, 1972, 5459/72; June 5, 1972, 7343/72
Int. Cl. A47c 5/04, 11/00
U.S. Cl. 297—445 2 Claims

A piece of sitting furniture has two separate, bent lateral frame bars and a body supporting support means fastened to and stretched between them by means of cross bars extending between the lateral frame bars and optionally one or more intermediate frame means, and each lateral frame bar is so bent as to form a loop of closed configuration in side view, said loop having a seat section which extends at least along the rear part of the seat portion, a rear back rest section which extends along the back rest portion, and a front back rest section ex-

tending forwardly of and approximately in parallel with the rear back rest section, said front back rest section merging at the top by means of a bend in the rear back rest section and joining at the bottom the front end of the seat section of the loop by means of further loop sections.

3,820,846

STOPE MINING MACHINERY HAVING FREE SWINGING HAMMERS

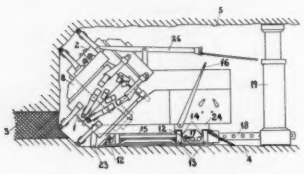
Richard F. Taylor, Johannesburg, South Africa, assignor to Anglo Transvaal Consolidated Investment Company Limited, Johannesburg, South Africa

Filed Feb. 29, 1972, Ser. No. 230,337

Claims priority, application South Africa, Mar. 3, 1971, 71/1362

Int. Cl. E21c *29/14*

U.S. Cl. 299—1 **19 Claims**



Mining machinery and more particularly stoping machinery utilizing rotors carrying free swinging hammers with the rotors mounted to be tilted relative to the stope footwall to facilitate the cutting of slots in the rock wider than the machine.

3,820,847

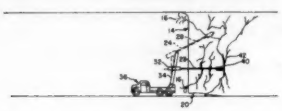
METHOD OF MINING A DEPOSIT OF ROCK SALT OR THE LIKE

Charles H. Jacoby, Dalton, Pa., assignor to Akzona Incorporated, Asheville, N.C.

Filed Nov. 16, 1972, Ser. No. 307,145

Int. Cl. E21c *41/08*

U.S. Cl. 299—5 **7 Claims**



There is disclosed a method for mining (rubblizing for transport to a processing plant) a mineral deposit comprised mainly of a hard "rock salt" type sodium chloride; potash; or the like mineral salt; having occasional inclusions therein of foreign materials which are of different heat conducting/absorbing characteristics. The method would apply to any mineral body which is of hard rock-like form having similar heat conductive and petro-fabric characteristics. Such mineral deposits may be either of sedimentary, or dome, or diaper form; and the method of the invention may be utilized when mining such deposits by any advancing face, or stope mining systems, or the like. The invention employs steam as a tool for shocking and splitting and rubblizing in-situ such mineral deposits; in such manner as to provide substantial mining cost economies, as well as substantial reductions in the percentages of undesirable "fines" in the mined products, compared to previously suggested and/or conventional mining techniques.

3,820,848

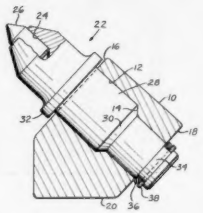
ROTARY MINING TOOL AND KEEPER ARRANGEMENT THEREFOR

Thomas J. Kniff, Bedford, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Apr. 2, 1973, Ser. No. 347,394

Int. Cl. E21c *25/46, 35/18*

U.S. Cl. 299—86 **11 Claims**



A rotary mining tool in the form of a bit symmetrical about the longitudinal axis and having a cylindrical shank rotatably supported in a support block. Cooperating elements of abutment means on the bit and the block support axial loads imposed on the bit. The bit is releasably retained in the block while permitted to rotate therein by a keeper arrangement on the rear end of the shank of the bit and which is in the form of a resilient ring on the shank of the bit at the back end of the block and a metal back up ring immediately behind the resilient ring.

3,820,849

CUTTING TIPS REMOVABLY SECURED IN MILLING CUTTER HEAD

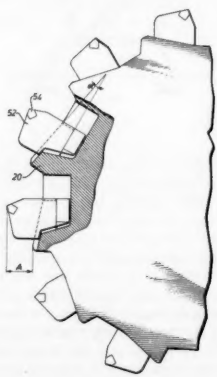
Hans Per Olof Lundstrom, and Bernt Soren Liljekvist, both of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Jan. 22, 1973, Ser. No. 325,456

Claims priority, application Great Britain, Dec. 1, 1972, 55744/72

Int. Cl. E21c *35/18*

U.S. Cl. 299—93 **2 Claims**



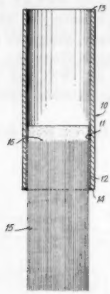
A carbide cutting tip is mounted in a separate cartridge which is removably secured in a rotary milling cutter head, so that break-down of the tip will not endanger damage to the cutter head but only the cartridge.

3,820,850

BRUSH CONSTRUCTION AND METHOD OF MAKING THE SAME

Gerhart Weiss, Flushing, N.Y., assignor to Baker Brush Co., Inc., New York, N.Y.

Filed Nov. 24, 1972, Ser. No. 309,347
Int. Cl. A46d *1/08*
U.S. Cl. 300—21 **11 Claims**



The present invention is directed to an improved method of making paint brushes or the like employing thermoplastic bristles, and to the resultant improved product.

The article is characterized by improved painting characteristics and particularly bristle flexibility, low manufacturing costs, high resistance to the penetration of solvents and tenacity of connection to the ferrule component of the brush.

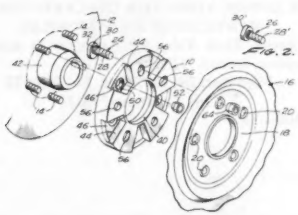
In accordance with the invention there is provided a heat resistant ferrule having an adhesive band formed about an internal surface. Thermoplastic bristles are loaded into the ferrule so that the upper bristle edges are aligned with the band, the lower ends of the bristles projecting from the ferrule. Heat is then applied to the upper bristle edges, causing the same to melt, flow into contact with and become securely bonded to the adhesive, which is bonded to the ferrule, securely to unite the bristles and ferrule.

3,820,851

WHEEL ADAPTOR

Isadore S. Longo, San Gabriel, and James J. Watson, Cerritos, both of Calif., assignors to CP Auto Products and Rocket Racing Products, Los Angeles, Calif., part interest to each

Filed May 2, 1973, Ser. No. 356,280
Int. Cl. B60b *3/14*
U.S. Cl. 301—9 DN **7 Claims**



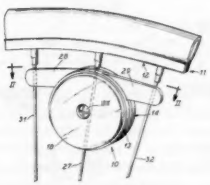
A wheel adaptor for adapting a wheel to a hub where the wheel has a different diameter of bolt hole circles and the diameter of the stud bolt circle on the hub. The adaptor has a circle of holes in it whereby it may be bolted on to the hub. The adaptor has a second circular pattern of holes which are elongated and which have counterbores, there being a group of stud bolts having elongated heads and shanks extending from the heads in an offset position, the elongated heads being receivable in a counterbore in two different positions whereby the studs may be positioned along bolt circles of a plurality of diameters. A further set of stud bolts is provided wherein the shanks are not offset from the heads so that when these stud bolts are in position they provide a further diameter of the stud bolt circle. Preferably the shanks of the stud bolts are axially grooved to be able to be fitted tightly into the holes in the adaptor.

3,820,852

SPOKE MOUNTABLE DISPLAY DEVICE WITH INTEGRAL BRACKET

James D. Kennedy, Streamwood, Ill., assignor to Beatrice Foods Company, Elgin, Ill.

Filed June 6, 1973, Ser. No. 367,404
Int. Cl. B60b *7/00*; **G09f** *7/00*
U.S. Cl. 301—37 R **10 Claims**



A display device for mounting over spokes of a spoked vehicle wheel between hub and rim portions thereof which has an integral bracket assembly requiring only a separate single screw member for mounting on a prechosen wheel spoke. The device further incorporates spoke engaging means which prevent it from revolvably turning about the mounting spoke.

3,820,853

CONCEPT OF INTERMEDIATE MIXING OF SLURRIES IN LONG PIPELINES

Thomas C. Aude, Moraga, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Jan. 15, 1973, Ser. No. 323,449
Int. Cl. B65g *53/30*
U.S. Cl. 302—66 **3 Claims**

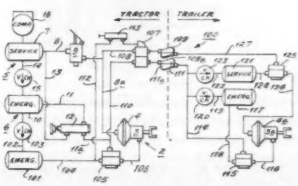
In the transmission of solids as a slurry through a pipeline, it is desirable to maintain a uniform slurry concentration, and this the present invention achieves.

3,820,854

CONTROL VALVE AND SYSTEM

George W. Stearns, St. Louis, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Division of Ser. No. 137,798, April 27, 1971, Pat. No. 3,746,401. This application Sept. 26, 1972, Ser. No. 292,442
Int. Cl. B60t *15/16*
U.S. Cl. 303—9 **15 Claims**



A brake system for a vehicle having a brake adapted for energization in response to a spring setting pressure released

actuator connected therewith is provided with a push-pull type control valve which is selectively operable to control the application and exhaustion of emergency pressure to and from said brake actuator to effect the de-energization and energization of said brake, and said control valve is automatically actuated in response to a predetermined low service pressure subjected thereto to exhaust the emergency pressure from said brake actuator to effect the spring set energization of said brake.

3,820,855

ANTI-SKID BRAKING SYSTEM

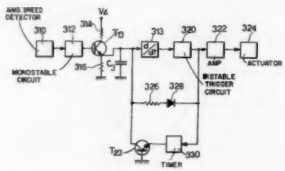
Gianfranco Salotti, and Mario Palazzetti, both of Avigliana, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Oct. 25, 1972, Ser. No. 300,607

Claims priority, application Italy, Oct. 29, 1971, 70568/71; Apr. 19, 1972, 68224/72

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 BE **3 Claims**



An anti-skid braking system and a process for anti-skid braking are disclosed. The system operates to release the brakes of a wheel whenever skidding is imminent this being detected from a signal representing the angular velocity of the wheel. A reference signal is then generated after a predetermined time delay and compared with the angular velocity signal. The value of the reference signal lies between the value of the angular velocity signal at the instant when the brakes are released and the value of the angular velocity signal after the said predetermined time delay. The two signals are then compared and the brakes are reapplied when the two signals have the same value, this occurs as the angular velocity of the wheel, after an initial delay, starts to increase when the brakes are released.

3,820,856

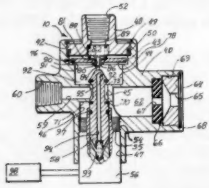
AIR BRAKE PRESSURE MODULATOR

Carmeli Adahan, 1930 Vine St., No. 303, Berkeley, Calif. 94709

Filed Nov. 10, 1972, Ser. No. 305,333

Int. Cl. B60t *8/06*

U.S. Cl. 303—21 F **7 Claims**



A brake pressure modulator for use in an air brake system on motor vehicles which also includes an antiskid control system for detecting actual or potential locking of the braked wheels. The brake pressure modulator is disposed in the control line and regulates the pressure in that line to control the release and reapplication of the brakes either directly when the control line is used to deliver air to the brake actuating chambers at the wheels or indirectly when the control line pressure is utilized to operate a relay valve which controls the delivery of brake applying air to the brake chambers at the wheels.

3,820,857

AUTOMOTIVE WHEEL BRAKE ANTI-LOCK SYSTEM

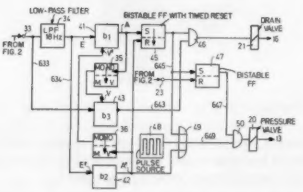
Eberhard Schnaibel, Hemmingen, and Werner Gotz, Friolzheim, both of Germany, assignors to Robert Bosch GmbH, Gerlingen-Schillerhoehe, Germany

Filed Jan. 22, 1973, Ser. No. 325,569

Claims priority, application Germany, Feb. 4, 1972, 2205175

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 BE **29 Claims**



To prevent skidding, particularly of the driven wheels, an acceleration signal of the driven wheels is provided which is applied to at least two, preferably three or four threshold switches which have different responses to levels of wheel acceleration or deceleration; a first threshold switch, when responding to wheel deceleration, controls interruption of supply of pressurized brake fluid to the wheel brakes and bleeding of pressurized brake fluid to lower braking effort; a second threshold switch responds to wheel acceleration to prevent unduly long draining of pressurized brake fluid and thus loss of braking effort; preferably a third threshold switch is provided responsive to only a low level of wheel deceleration to prevent draining of pressurized brake fluid and hold braking effort at a level below skidding. Preferably, a pulse source is provided to permit pulsed application of pressurized brake fluid to the wheel brakes and thus gradually increase wheel braking pressure to further increase braking effort until the first deceleration switch again responds.

3,820,858

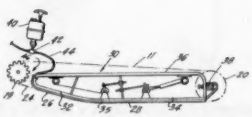
TRACK LUBRICATION FOR TRACKED VEHICLE, IN PARTICULAR SNOWMOBILES

Paul H. Reeve, River Vale, N.J., assignor to Auto Research Corporation, Boston, N.J.

Filed Apr. 28, 1972, Ser. No. 248,622

Int. Cl. B62m *27/02*

U.S. Cl. 305—14 **6 Claims**



A ground contacting track of a snowmobile moves past a guide slide provided with a lubricant delivery formation, e.g. a T-shaped groove. The vertical leg of the T leads from an oil

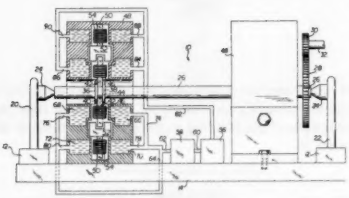
supply means. The cross leg of the T extends across the slide and delivers oil across the slide. The cross leg is located near the initial point of contact between the slide and the track and where the track is first pressed against the slide by contacting the ground.

3,820,859

ELECTRO MAGNETIC, SUPER-COOLED BEARING

Roger A. Brown, 7919 W. Hampton Ave., Milwaukee, Wis. 53218

Filed Mar. 27, 1972, Ser. No. 263,723
Int. Cl. F16c *39/06*
U.S. Cl. 308—10 **7 Claims**



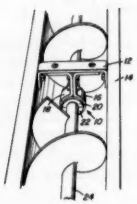
A bearing structure for a rotating shaft including first magnet means extending from the shaft and second magnet means fixed to the supporting housing for the shaft and displaced in the circular path of the first magnet means, cooling means displaced adjacent the circular path of the first magnet means, whereby the shaft is magnetically suspended in radial and axial directions.

3,820,860

VARIABLE BORE CLEARANCE BEARING

Alan J. Stone, Oneoye, N.Y., assignor to Stone Conveyor, Inc., Honeoye, N.Y.

Filed Aug. 3, 1972, Ser. No. 277,506
Int. Cl. F16c *33/04*
U.S. Cl. 308—27 **4 Claims**



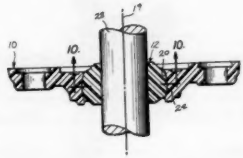
A bearing assembly comprising a pair of half bearing members each of generally semi-cylindrical configuration with a pair of diametrically opposite radial surfaces, a boss protruding from one of the surfaces and a similarly shaped indentation on the opposite surface, whereby the pair of bearing members may be mated together either with the boss of one of the members in the indentation of the other member, or alternatively with the bosses abutting each other to provide two bore clearance settings for accommodation of slightly different shaft diameters or to compensate for warping, wear, or expansion rates.

3,820,861

SELF-ALIGNING BEARING MEMBER

Samuel J. Strang, Mishawaka, Ind., assignor to The Injection Plastic Co., Inc., Tippecanoe, Ind.

Filed May 25, 1973, Ser. No. 363,874
Int. Cl. F16c *9/06;* **B21d** *53/10*
U.S. Cl. 308—72 **3 Claims**



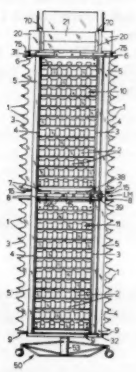
A bearing member having self-aligning features and which is of a multiple part construction including a housing and a bearing unit. The bearing member housing has an elliptical opening formed therein which receives in removable interlocking cooperation the universally tiltable bearing unit which has an outer edge also of an elliptical configuration.

3,820,862

THEFT PROOF DISPLAY DEVICE

Louis John Crosslen, Grafton, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.

Filed Apr. 4, 1973, Ser. No. 347,906
Int. Cl. A47f *3/00*
U.S. Cl. 312—123 **16 Claims**



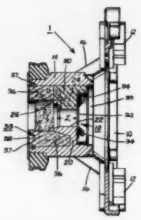
A theft proof display device including a plurality of vertical shelf units, each of which is pivotally mounted along one of its vertical sides so that each unit can be swung from a center support structure and between an open display position from which merchandise can be removed, and a closed position in which the open side of the shelves face inwardly toward the center support structure and thereby prevent removal of the merchandise from the shelves. Locking means are provided for simultaneous locking of all of the shelves, such locking being accomplished by turning a single handle.

3,820,863

UNITARY END FRAME AND BEARING SUPPORT MEMBER FOR A DYNAMOELECTRIC MACHINE

Charles W. Otto, Dekalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 21, 1972, Ser. No. 246,286
Int. Cl. F16c *33/66*
U.S. Cl. 308—132 23 Claims



A unitary support member is disclosed for a dynamoelectric machine comprising an end frame and a bearing surface having a preselected configuration of definitive length. The bearing surface has a longitudinal slot therein extending substantially the definite length whereby a lubricant impregnable wick may be mounted within the slot from which wick lubricant may be supplied directly throughout the definitive length to the bearing surface in lubricating a shaft rotatably journalled through the bearing.

ERRATUM

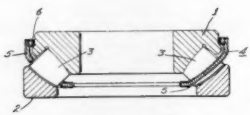
For Class 308—201 see:
Patent No. 3,820,867

3,820,864

CAGE FOR A ROLLING BEARING AND METHOD OF MAKING IT

James Gusten Ragnar Petre, Onsala, Sweden, assignor to SKF Industrial Trading and Development Company, B.V., Amsterdam, Netherlands

Filed Apr. 9, 1973, Ser. No. 349,249
Claims priority, application Sweden, Apr. 18, 1973, 734687
Int. Cl. F16c *19/20*
U.S. Cl. 308—201 4 Claims



A rolling bearing assembly includes a plurality of rolling elements and a cage for said elements. The portions of the cage which do not contact the elements are covered with a fibre flock.

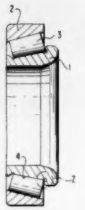
3,820,865

CONICAL ROLLER BEARING FOR WHEEL BEARINGS

Kurt Trachte, Echterdingen, and Hans J. Brummer, Rommelshausen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Apr. 20, 1973, Ser. No. 352,991
Claims priority, application Germany, Apr. 20, 1972, 2219327
Int. Cl. F16c *19/00*
U.S. Cl. 308—214 8 Claims

A conical roller bearing for wheel bearings of motor vehicles which includes an outer race and an inner race and bearing rollers of essentially truncated conical shape; an annular gap is thereby formed between the bearing surface of the inner race and a circular ring placed radially inwardly against the bearing roller; with a length of about 3 to 4 mm., the gap has a maximum radial thickness of about 40/1000 to about 60/1000 of a millimeter whereby the length of the conical ring gap to the overall length of the bearing surface is at the ratio of about 1:3 to about 1:5.

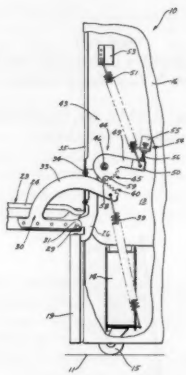


3,820,866

APPLIANCE DOOR CONTROL MECHANISM

Henry J. Kaldenberg, Des Moines, Iowa, assignor to The Maytag Company, Newton, Iowa

Continuation of Ser. No. 163,047, July 15, 1971, which is a continuation of Ser. No. 820,735, May 1, 1969, abandoned.
This application Apr. 23, 1973, Ser. No. 353,818
Int. Cl. A47b *81/00*
U.S. Cl. 312—276 14 Claims



A door control mechanism for an appliance is operable for controlling movement of the door between a substantially horizontal normally open position and an overload position at which a portion of the door engages the floor. The door control mechanism is preloaded to maintain the door in the horizontal position when supporting less than a predetermined loading but will effect movement of the door to the floor responsive to an overloading of the door for preventing tipping of the appliance.

ERRATUM

For Class 312—276 see:
Patent No. 3,820,866

3,820,867

SEGMENTED RETAINING RINGS FOR ANTIFRICTION BALL BEARINGS

Thorn W. Dickinson, Berlin, and Chester Gronski, Newington, both of Conn., assignors to Textron, Inc., Providence, R.I.

Filed Dec. 29, 1972, Ser. No. 319,560
Int. Cl. F16c 33/38
U.S. Cl. 308—201 5 Claims

An antrifriction ball bearing includes a segmented retaining ring formed by first and second pluralities of metal stampings, each plurality being arranged end-to-end in a circle. The antifriction elements are retained in truncated spherical cavities, formed between angularly registered concaved surfaces of the stampings. Angularly registered flat surfaces disposed between the concaved surfaces are joined to each other by spot welds or rivets. This construction, particularly when applied to large diameter bearings, lends itself to simplified production of the retaining ring with significantly more efficient use of materials than was possible previously.

ERRATUM

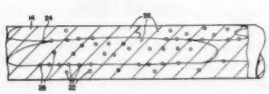
For Class 312—123 see:
Patent No. 3,820,862

3,820,868

METHOD OF MAKING NON-SAG INCANDESCENT TUNGSTEN FILAMENT

Heinz G. Sell, Cedar Grove, N.J., and Heinz-J. Stepper, Konigsbrunn, Germany, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 217,162, Jan. 12, 1972. This application Nov. 24, 1972, Ser. No. 309,590
Int. Cl. H01j 9/02
U.S. Cl. 316—1 4 Claims



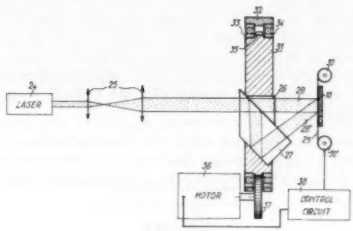
Incandescent lamp incorporates a non-sag tungsten filament having a microstructure comprising a plurality of elongated and interlocking grains disposed along the axial dimension of the filament. A large number of very minute inert gas bubbles, such as helium bubbles, are included within the filament, and a portion of the bubbles are generally aligned along the axial dimension of the filament and are positioned at the boundaries of the interlocking grains which comprise the filament. In the method for making the filament, inert gas atoms, such as helium atoms, are formed within the tungsten and when the filament is incandesced, the atoms migrate to form the very minute helium bubbles.

3,820,869

FOCUSSED IMAGE HOLOGRAPHIC MEMORY

Christian S. Bolusset, Kerlerranouet, Perros Guirec; Michel E. Treheux, Pleumeur-Bodou; Francis R. Alard, La Rose des Vents, Ploumilliau, and Michel E. Malaboeuf, Lannion, all of France

Filed Dec. 27, 1972, Ser. No. 318,802
Claims priority, application France, Dec. 28, 1971, 71.47411
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 3 Claims



Apparatus for recording and retrieving graphical information comprising at least one laser and means for directing onto a light sensitive carrier two collimated beams of laser radiation are employed and superimposed images are recorded. The azimuth angle between the first and second beams is adjusted.

3,820,870

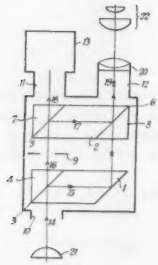
PHOTOMETRIC INSTRUMENTS

Francis Hughes Smith, York, England, assignor to Vickers Limited, London, England

Filed Jan. 8, 1973, Ser. No. 321,932
Claims priority, application Great Britain, Jan. 14, 1972, 1949/72
Int. Cl. G02b 21/18
U.S. Cl. 350—33 6 Claims

A photometric instrument comprises an objective which forms an input light beam bearing an image of an object, a photodetector, and a housing between the objective and the photodetector. The housing has an inlet aperture, for admitting the input light beam from the objective and contains a first beam-splitter mounted to receive the input light beam and split it into first and second beams. A diaphragm is mounted in the path of the first beam for passing those rays of that beam which emanate from a limited area of the object

and for blocking those rays of the first beam which emanate from regions of the object outside of that limited area. A second beam-splitter receives the passed rays of the first beam and divides them into a first pencil of light rays directed towards the photodetector by way of a first output aperture of the housing and a second pencil of light rays directed towards a beam-combiner. The beam-combiner combines the second



pencil of light rays with the second beam formed by the first beam-splitter to provide a composite output beam which is directed towards a second outlet aperture of the housing and which can be brought to a focus to produce an image of the object in which the limited area of the object appears with increased intensity as compared with the regions outside the limited area.

3,820,871

SHORT WAVELENGTH WAVEGUIDES FORMED OF METAL OXIDES

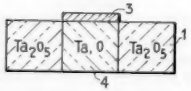
Michel Croset, and Gonzalo Velasco, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 10, 1972, Ser. No. 279,360

Claims priority, application France, Sept. 16, 1971, 71.33390

Int. Cl. G02b *5/14*

U.S. Cl. 350—96 WG **8 Claims**



A light waveguide is formed by atomising under vacuum and deposition upon a substrate, of a metal such for example as tantalum, in an atmosphere comprising a gas capable, in association with the metal, of forming a chemical combination, oxygen in the case of tantalum. The deposit is a complex compound of the metal and of the gas if the gas pressure is insufficient to produce the desired chemical combination (tantalum pentoxide Ta_2O_5); the assembly, after appropriate masking, is subjected to a chemical process which converts the unprotected parts into said combination.

3,820,872

RETRO-REFLECTOR

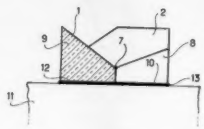
Rene Lenfant, Paray Vieille Poste, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Dec. 27, 1972, Ser. No. 318,975

Claims priority, application France, Dec. 27, 1971, 71.46760

Int. Cl. G02b *5/12*

U.S. Cl. 350—102 **6 Claims**



A retro-reflector optical device is formed by three prismatic blocks each having a first and second plane face, one constituting the plane reflecting surface and the other lying coplanar and fixed thereby to a plane base.

3,820,873

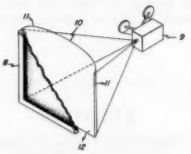
SCREEN FOR PRODUCING AN ENHANCED IMPRESSION OF DEPTH

Rowland W. Redington, Schenectady, and John L. Henkes, Jr., Loudonville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 26, 1973, Ser. No. 354,895

Int. Cl. G03b *21/56*

U.S. Cl. 350—125 **12 Claims**



An enhanced impression of depth is obtained from a projection screen having a concave surface formed by forward curving edges at the sides and bottom. The central portion of the screen is flat, or has a large radius of curvature, and the edges have a small radius of curvature. A section of the screen approximates the shape of an elongated ellipse, i.e. with major axes in the ratio of 8:1 or greater.

3,820,874

STEREOSCOPIC PHOTOGRAPHIC PRINT, METHOD OF MAKING, AND APPARATUS FOR VIEWING

Julius J. Scarpetti, Revere, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

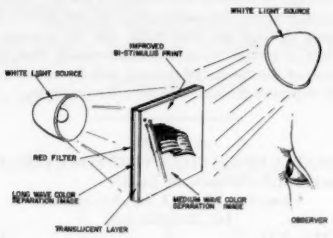
Continuation-in-part of Ser. No. 203,898, Dec. 1, 1971, abandoned. This application Sept. 11, 1972, Ser. No. 287,628

Int. Cl. G03b

U.S. Cl. 95—1 R **8 Claims**

An improved bi-stimulus print incorporates a color filter on its back side. A variegated (multicolor) image of a subject printed on the bi-stimulus print is perceivable even though the image is formed from just two monochromatic images. In one embodiment, the bi-stimulus print comprises a red color separation image of the subject printed in grey tones on the back of a thin translucent sheet and a green color separation image of the same subject printed, in registration with the red color separation image, in grey tones on the front side of the

translucent sheet. In a second embodiment the images are related stereoscopically. A red light filter is attached to the back of the bi-stimulus print. One can illuminate the front of the bi-stimulus print and see the image in black and white by



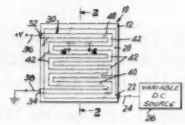
reflected light; and by illuminating the rear of the bi-stimulus as well, one can perceive a variegated image by viewing a combination of the reflected light and the transmitted red light passed by the filter. The improvement is applicable to anaglyphs.

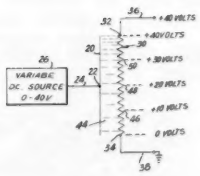
3,820,875

SCANNER DEVICES UTILIZING FIELD EFFECT LIGHT SCATTERING DIELECTRICS

William Bohmer, 763 Van Nest Ave., Bronx, N.Y. 61646

Filed Apr. 14, 1972, Ser. No. 243,996
Int. Cl. G02f *1/28*
U.S. Cl. 350—160 LC **39 Claims**





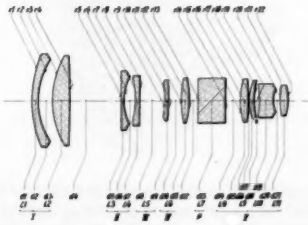
A region of a field effect light scattering dielectric is selectively actuated in a device including a pair of spaced plates having said field effect light scattering dielectric therebetween and having a resistor defining a resistive electrical path of predetermined length and configuration mounted on the inner surface of one of said plates and a substantially nonresistive conductor mounted on the inner surface of the other of said plates in facing relation to said resistor. At least one of said plates and the resistor or conductor mounted thereon are transparent. A first voltage is applied between the ends of the electrical path of said resistor and a second variable voltage is applied to said conductor. Selective adjustment of said second voltage displaces the point on said resistor at which the voltage equals said second voltage to render the region of said dielectric adjacent said point visually distinguishable from other regions thereof.

3,820,876

HIGH-SPEED VARIFOCAL OBJECTIVE SYSTEM

Karl Macher, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke, Bad Kreuznach, Germany

Filed Dec. 26, 1972, Ser. No. 318,163
Claims priority, application Germany, Dec. 28, 1971, 2164937
Int. Cl. G02b *15/16*
U.S. Cl. 350—184 **8 Claims**



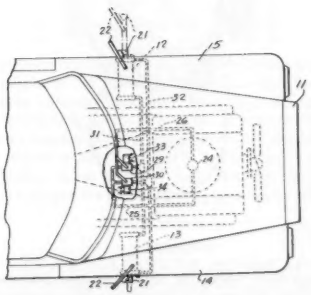
A zoom-type objective system designed for Super-8 motion-picture cameras includes a fixed-focus basic objective and a varifocal front attachment with two fixed positive components bracketing two axially movable negative components. The attachment and the basic objective are separated by a reflex prism which may be removed to enable relocation of the basic objective into a forward position suitable for close-ups. Several combinations of the same basic objective with different attachments are disclosed, the interchange of certain of these attachments enabling a modification of the zoom range.

3,820,877

EXTENDABLE AND RETRACTABLE MOTOR VEHICLE MIRROR ARMS

James E. Moyer, 5727 Rio Verde Way, North Highlands, Calif. 95660

Filed Mar. 19, 1973, Ser. No. 342,547
Int. Cl. G02b *5/08*
U.S. Cl. 350—289 **3 Claims**



Motor vehicle mirror arms can be extended or retracted from the dashboard of the vehicle to a point beyond the width of the motor vehicle to enhance the visibility to the rear. The mirror arms are moved by hydraulic, air, vacuum, or electric means and can be positioned at any desired point from fully retracted to fully extended.

3,820,878
SPECTRAL ZONAL INFORMATION STORAGE AND RETRIEVAL

Peter F. Mueller, Concord, Mass., assignor to Technical Operations, Incorporated, Burlington, Mass.

Division of Ser. No. 130,163, April 1, 1971, Pat. No. 3,719,127, which is a continuation-in-part of Ser. No. 726,455, May 3, 1968, Pat. No. 3,664,248, which is a continuation-in-part of Ser. No. 564,340, July 11, 1968, abandoned. This application Nov. 2, 1972, Ser. No. 303,092

Int. Cl. G02b *5/22*

U.S. Cl. 350—317 **21 Claims**

This disclosure depicts methods and means for implementing a novel optical information processing technique utilizing a phenomena (herein termed Fourier optical synthesis) involving effecting a complex amplitude addition of diffraction spectra characterizing two or more object functions. The processed object functions may represent totally different scenes, or color separation functions of a common colored scene. The disclosure stresses novel mosaic three zone spectral zonal encoding filters and methods of color information storage and retrieval using the novel filters.

3,820,879
BIOMICROSCOPIC EYE CONTACT GLASS

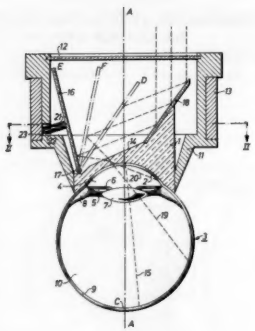
Lars Frisen, Askim, Sweden, assignor to Incentive Research & Development AB, Stockholm, Sweden

Filed Dec. 29, 1972, Ser. No. 319,484

Claims priority, application Sweden, Jan. 31, 1972, 1100/72

Int. Cl. A61b *3/10*

U.S. Cl. 351—1 **10 Claims**



A contact glass device for biomicroscopic examination of the human eye, comprises a lens body with a concave surface adapted for application upon the cornea of the eye to be examined with the optical axis of the lens coinciding with the optical axis of the eye and two light reflecting mirror surfaces disposed at the side of the lens body opposite to said concave surface so as to face each other on opposite sides of the optical axis of the lens. The two mirror surfaces are inclined at such angles relative to the optical axis of the lens body and relative to each other that it is possible to view the interior of an eye, on which the lens body is applied with its concave surface, in a non-reversed manner along a line of view which is reflected in the two mirror surfaces and passes through the lens body. In a preferred embodiment of such a contact glass device one of the two mirror surfaces is pivoted relative to the lens body so that the field of view within the interior of the eye, which is obtained along a line of view reflected in the two mirror surfaces and passing through the lens body, can by rotation of the pivoted mirror surface be moved continuously from the central portion of the fundus of the eye radially outwards to the boundary region of the fundus at the ciliary muscle.

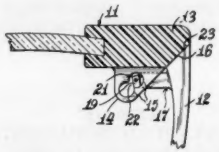
3,820,880
ADJUSTABLE HINGE STRUCTURE FOR EYEGLASSES

Mary Burke, Rt. 2, Tampico, Ill. 61283

Filed Mar. 19, 1973, Ser. No. 342,686

Int. Cl. G02c *5/22*

U.S. Cl. 351—121 **2 Claims**



An adjustable hinge structure for eyeglass frame temples adapting the temples for adjustment toward and away from the sides of the head.

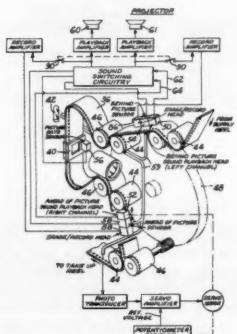
3,820,881
SINGLE SYSTEM SOUND CAMERA AND PROJECTOR FOR MOTION PICTURES

Dietrich P. Friesen, 2243 Lakeview Ave., Los Angeles, Calif. 90039

Filed July 30, 1973, Ser. No. 383,974

Int. Cl. G03b *31/02*

U.S. Cl. 352—5 **17 Claims**



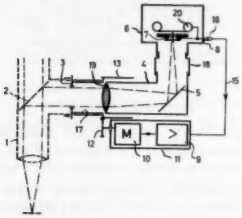
A motion picture sound camera and projector for recording and playing back associated audio and visual inputs on the same strip of film. Motion picture film having first and second sound tracks recorded ahead and behind their associated picture frames. Splicing the film and coding it to coordinate the playback of the sound tracks in connection with the picture frames before and after the splice.

3,820,882

AUTOMATIC DIAPHRAGM CONTROL FOR MOTION PICTURE CAMERAS USED ON OPERATION MICROSCOPES

Heinz Jakubowski, Oberkochen, Germany, assignor to Carl Zeiss Stiftung d/b/a Carl Zeiss Heindenheim on the Brenz, Wurttemberg, Germany

Filed Mar. 19, 1973, Ser. No. 342,766
Claims priority, application Germany, Mar. 25, 1972, 7211495
Int. Cl. G03b 29/00
U.S. Cl. 352—131 5 Claims



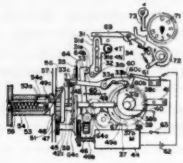
An arrangement for attaching a motion picture camera to a microscope used in a surgical operation, to enable automatic control of the diaphragm aperture of the camera as the operation proceeds. The microscope is provided with a beam splitter which directs part of the light laterally into an adapter which contains an iris diaphragm adjusted by a motor. The adapter also has a reflecting unit for reflecting the light upwardly toward a motion picture camera mounted on the adapter in a position laterally of the microscope axis. In the camera is a light responsive cell which measures the light reaching the camera and which, through a cable connection to an amplifier, controls the motor to adjust the aperture of the diaphragm in the adapter to make it larger or smaller, as required. The amplifier and the motor are preferably in a unit separate from the adapter itself.

3,820,883

MOTION PICTURE CAMERA

Isamu Kubota, Izumisano, and Yukio Miki, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

Division of Ser. No. 181,333, Sept. 17, 1971. This application Aug. 9, 1972, Ser. No. 279,040
Int. Cl. G03b 21/36
U.S. Cl. 352—91 S 5 Claims



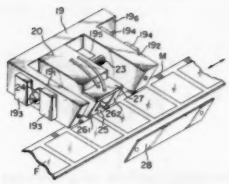
A film moving control device for a motion picture camera so designed that by shifting a cam up to 180° for operating a feed claw in phase relative thereto, the normal photographing and the reverse photographing can be carried out by a driving mechanism operated in only one direction. Moreover, the normal photographing and the overlap photographing accompanied by reverse transfer can be carried out by the driving mechanism driven in one direction.

3,820,884

SEARCH READER

Yoshiaki Sone, and Takamasa Sawada, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1972, Ser. No. 306,840
Claims priority, application Japan, Nov. 16, 1971, 46-92160
Int. Cl. G03b 23/12; B65h 23/04
U.S. Cl. 353—26 2 Claims



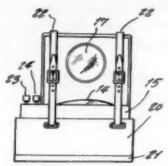
A search reader in which a desired image frame in a rolled microfilm may be automatically selected and stopped at a predetermined position and projected on a viewing screen. The reader includes a light-receiving element opposed to an illuminating light source with the microfilm interposed therebetween for receiving light from an index mark on the film and producing a detection signal. The light-receiving element is carried on a movable member. Means is provided to displace the index-mark detecting position of the light-receiving element in accordance with the position of the index mark recorded on the film.

3,820,885

T. V. PROJECT-O-SCOPE

Bennie S. Miller, 536 N. Cave St., Princeton, Ky. 42445

Filed May 2, 1973, Ser. No. 356,593
Int. Cl. G03b 21/28
U.S. Cl. 353—98 1 Claim



A device for making viewing of a small screen television set more enjoyable and comfortable for an entire family or large number of persons; the device consisting of a unit that supports an angularly positioned mirror in front of a television set screen so that the picture image projected from the T.V. set on the mirror is then passed through lens and reflected on a larger screen some distance away in order that the picture image is enlarged for easier viewing by many at one time.

3,820,886

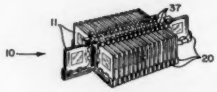
ENDLESS FLEXIBLE SLIDE MAGAZINE

Gerald J. Frey, 3887 State St., Suite 202, Santa Barbara, Calif. 93105; Milton Wadler, Goleta, and Paul H. Harrison, Santa Barbara, Calif., assignors to said Frey, by said Harrison and Wadler

Filed Feb. 5, 1973, Ser. No. 329,900
Int. Cl. G03b 23/08
U.S. Cl. 353—109 49 Claims

A flexible annular magazine for holding a plurality of slides in a slide projector, and comprising an annular series of L-

shaped, molded plastic slide-holding elements hingedly joined together. Each L-shaped element has two coplanar seats in the adjacent sides of the legs of the "L" for receiving two contiguous side edges of a slide, formed in the preferred embodiment by two laterally spaced sets of tabs on each leg, for receiving a slide between them, the slide being releasably held in the seats by two movable detent fingers at the free ends of the legs. Alternative forms have V-shaped grooves forming the seats in the vertical legs of the elements and deep seats formed by upwardly diverging sidewalls in the horizontal legs, in



which the lower edge portion of a slide can be wedged. The preferred hinges are formed by snap-locking pin-and-socket elements molded integrally with each vertical leg, and alternatives include a one-piece molded belt having fins upon which individual elements are mounted, a one-piece molded magazine in which the elements are connected by webs forming living hinges molded integrally with the elements, a preformed fabric belt upon which the elements are molded, and a series of elements tied together by endless elastic bands interfitting with notches in the elements.

3,820,887

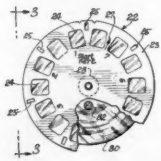
TONE ARM AUTOMATIC RESET MECHANISM FOR AN AUDIO-VISUAL DEVICE

Alan G. Lewis, West Linn, Oreg., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 73,562, Sept. 18, 1970, Pat. No. 3,685,892. This application Dec. 23, 1971, Ser. No. 211,622

Int. Cl. G09f *27/00*

U.S. Cl. 353—120 **2 Claims**



The audio-visual device includes a slot for receiving an audio-visual unit consisting of a transparency disk and a record rotatably mounted from the disk. A mechanism serves to index the tone arm for playing successive spaced messages on the record in response to movement of a manually operated arm which advances the transparency disk for viewing of successive transparencies. A reset mechanism is associated with the indexing mechanism for returning the tone arm to a starting position. A tripping mechanism cooperates with the reset mechanism to release the tone arm; this tripping mechanism is actuated by a projection on the transparency disk as the latter is moved to its starting position.

3,820,888

MISTRACK INTERLOCK FOR SELENIUM BELT

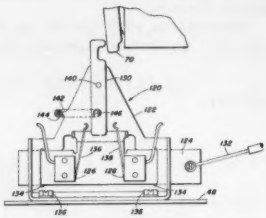
William E. Jordon, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 1, 1972, Ser. No. 311,344

Int. Cl. G03g *15/00*; **B65h** *25/06, 25/26*

U.S. Cl. 355—3 R **1 Claim**

A switching assembly for an endless belt assembly of an electrostatographic machine is disclosed including two switches and a switch lever disposed therebetween is provided near the photoconductive belt assembly with the switch lever being in contact with a sensing ring of a tracking assembly for the endless belt assembly. The switching lever moves response to variations in positioning of the sensing arm and will de-ac-



tivate the operational mode of the machine through the switching assembly should the tracking of the belt become irregular and uncontrollable. Additionally, the switching assembly may be opened by an adjusting means to prevent the unintentional start-up of the belt assembly during replacement of a belt.

3,820,889

COPY SHEET GUIDE DEVICE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

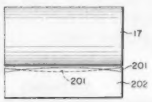
Hiroshi Nitanda; Hiroyuka Hattori, and Koichi Miyamoto, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1972, Ser. No. 308,571

Claims priority, application Japan, Nov. 25, 1971, 46-94651

Int. Cl. G03g *15/22*

U.S. Cl. 355—3 R **4 Claims**



In an electrophotographic copying machine of the image transfer type, a guide device for guiding a transfer medium (image-receiving copy sheet) toward a photosensitive medium or drum from which the image is transferred, comprising transport roll means and a pair of parallel upper and lower transfer medium guide plates provided between the transport roll means and the photosensitive medium and adapted to guide a transfer medium between the guide plates. The upper guide plate, which lies adjacent to the back side of the transfer medium in the portion of its path immediately before image transfer, has the forward end edge thereof formed into a convex curve with respect to the surface of the photosensitive medium. The forward end edge of the lower plate may be straight or concave.

3,820,890

INFORMATION STORAGE AND RETRIEVAL SYSTEM

Manfred R. Kuehnle, Lexington, Mass., assignor to Audac Corporation, Burlington, Mass.

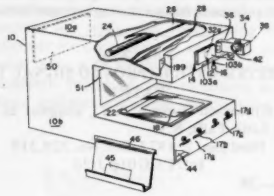
Filed June 8, 1970, Ser. No. 44,273

Int. Cl. G03g *15/00*

U.S. Cl. 355—5 **34 Claims**

An information storage and retrieval system includes a housing with a passage through it. A lens system is contained

in the passage for projecting an image onto a microfiche portion positioned in register with the end of the passage. Electrodes are mounted in the passage for producing a corona



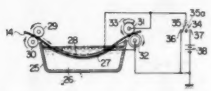
discharge in the passage which charges the microfiche prior to its exposure to the image and toner is introduced into the passage after such exposure to develop the image on the microfiche portion.

3,820,891

ELECTROPHOTOGRAPHIC COPYING METHOD USING A LIQUID DEVELOPING AGENT CAPABLE OF EFFECTING BOTH REGULAR COPYING AND INVERSE COPYING

Junji Kurakawa, Yokohama, and Setsuo Soga, Tokyo, both of Japan, assignors to Ricoh Co. Ltd., Tokyo, Japan

Filed May 18, 1973, Ser. No. 361,645
Claims priority, application Japan, May 25, 1972, 47-52329
Int. Cl. G03g *13/10, 15/10*
U.S. Cl. 355—10 **7 Claims**



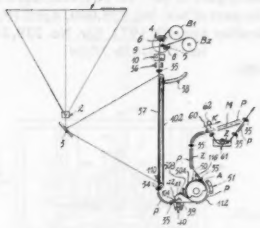
A method of electrophotography using a liquid developing agent permitting regular copying (positive-to-positive and negative-to-negative) or inverse copying (positive-to-negative and negative-to-positive) to be effected by selectively charging a photoreceptor either positively or negatively without the need to bother to use a developing agent of a suitable polarity. The method comprises the steps of charging the photoreceptor so that it may carry a charge of a selected polarity, exposing the charged photoreceptor to an optical image of an original to be copied, developing an electrostatic latent image formed by exposure on the photoreceptor or an electrostatic latent image transferred from the photoreceptor to a copy sheet with a liquid developing agent, and squeezing out excess liquid developing agent from the photoreceptor or copy sheet after developing by means of a squeeze roller. When toner particles in the liquid developing agent are of the same polarity as the electrostatic latent image on the photoreceptor or copy sheet, a bias voltage of the same polarity as the electrostatic latent image is impressed on the squeeze roller when brought into contact with the image-bearing surface of the photoreceptor or copy sheet, or such squeeze roller is electrically insulated from other members in the squeezing step. When the charge carried by the toner particles is of opposite polarity to the charge carried by the electrostatic latent image, the squeeze roller when brought into contact with the image-bearing surface of the photoreceptor or copy sheet is grounded. By this arrangement, duplicates of optimum density and good contrast can be produced without the squeeze roller developing an offset phenomenon both in regular copying and inverse copying.

3,820,892

DOUBLE-REEL APPARATUS FOR ELECTROSTATICALLY PRODUCING COPIES AND MATRICES

Vittorio Boschet, Milan, Italy, assignor to Grafosol S.p.A., Milan, Italy

Filed Apr. 16, 1973, Ser. No. 351,195
Claims priority, application Italy, May 4, 1972, 23898/72
Int. Cl. G03b *19/04*
U.S. Cl. 355—13 **7 Claims**



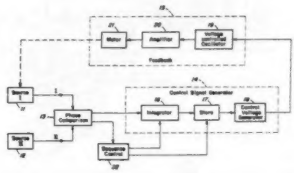
An apparatus for electrostatically producing copies in the form of individual paper copies and/or matrices, comprising supply roles for providing copy paper, means for withdrawing and feeding the copy paper, a cutting device for cutting a predetermined length of copy paper, a device for electrostatically charging a sheet of copy paper prior to its being exposed a developing and fixing device for the latent image produced during exposure, wherein the apparatus has two different supply rolls, and depending on the preselected supply roll a different withdrawing device is operated, while the withdrawing device for the unselected supply roll causes the associated support to be retracted in order to prevent the cutting device from operating at the same time on the copy material from the two supply rolls.

3,820,893

SYNCHRONIZING APPARATUS

James M. Donohue; Joseph R. Kramer, and Victor Rodek, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 89,869, Nov. 16, 1970. This application Aug. 25, 1972, Ser. No. 283,672
Int. Cl. G03b *27/48*
U.S. Cl. 355—14 **2 Claims**



Synchronizing apparatus is disclosed in accordance with the teachings of the present invention wherein the operation of a first device is regulated in accordance with the operation of a second device. The phase relationship between signals representing the operation of the first and second devices, respectively, is determined by comparison means which produces a pulse width modulated signal indicative of said phase relationship. Control signal generating means responds to the pulse width modulated signal to generate an analog signal having an amplitude established by said phase relationship. Feedback means, including variable frequency generat-

ing means, is controlled by the analog signal to modify the operation of the first device whereby said first device is urged into a synchronous relationship with said second device and the signals representative of the operation of said first and second devices admit of a desired phase relationship.

3,820,894

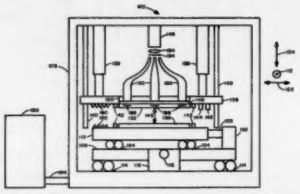
APPARATUS AND METHOD FOR PRODUCING HIGH REGISTRATION PHOTO-MASKS

Gilbert P. Hyatt, 11101 Amigo Ave., Northridge, Calif. 91324

Continuation-in-part of Ser. No. 101,881, Dec. 28, 1970, Continuation-in-part of Ser. No. 134,958, April 19, 1971, Continuation-in-part of Ser. No. 135,040, April 19, 1971. This application Apr. 13, 1972, Ser. No. 229,213

Int. Cl. G03b *27/04*

U.S. Cl. 355—86 **45 Claims**



A system is provided for producing high registration photo-optical masks. A control system generates signals to a step and repeat contact printing machine that exposes many prints of the master die images on a photographic film, where these prints have a high registration characteristic.

3,820,895

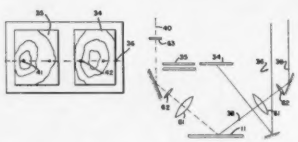
METHOD AND APPARATUS FOR MENSURATION OF THREE-DIMENSIONAL OBJECTS AND OF STEREOMODELS OF SUCH OBJECTS

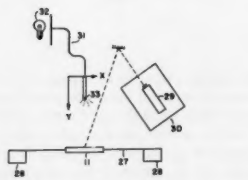
Edward M. Mihail; Warren H. Stevenson, and Maurice K. Kurtz, Jr., all of Lafayette, Ind., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 24, 1971, Ser. No. 146,032

Int. Cl. G01c *11/12*; **G02b** *27/02*

U.S. Cl. 356—2 **6 Claims**





A method and apparatus for

1. Accurate mensuration of a three-dimensional object by insertion of a self-illuminated mark in the virtual image produced when a hologram of the object is illuminated, with X, Y, Z planes measurement means connected to said mark including means for recording said X, Y, Z coordinate, and

2. Construction of a holographic stereomodel from either diapositive transparencies or photographic prints using two simultaneous reference beams during reconstruction.

3,820,896

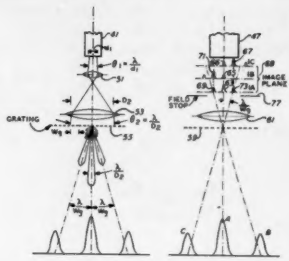
VELOCIMETER WITH IMPROVED SIGNAL TO NOISE RATIO

Gus Stavis, Croton-on-Hudson, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed Jan. 2, 1973, Ser. No. 320,319

Int. Cl. G01p *3/36*

U.S. Cl. 356—28 **7 Claims**



An improved laser velocimeter in which both magnitude and sense of direction are provided and which has an improved signal to noise ratio is shown. To obtain sense of direction the conventional laser velocimeter which includes a transmitting beam and a receiver comprising a grating and a photo detector, has added to it a second grating and detector. The second grating being shifted one-quarter of a line pair from that of the first resulting in two outputs which are shifted 90 degrees from each other. This information is processed in a well-known manner to obtain an output indicative of sense of direction. To improve signal to noise ratio a grating is used with the transmitted beam to cause it to form three separate beams which when received through the receiving grating will be superimposed upon each other to cause a greater portion of the signal to be utilized by the detector.

3,820,897

SYSTEM FOR THE OPTICAL MONITORING OF AIR POLLUTANTS IN A LARGE SPACE

Dieter Roess, Planegg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 19, 1972, Ser. No. 263,933

Claims priority, application Germany, July 2, 1971, 2133080

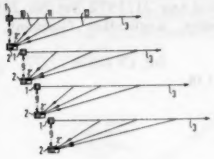
Int. Cl. G01j *3/44*

U.S. Cl. 356—75 **7 Claims**

A system for monitoring air pollutants in which laser radiation excites atoms and molecules contained in the atmosphere

to specific Raman radiations, and the scattered radiations analyzed, utilizing a plurality of laser transmitting stations arranged in a line and a corresponding plurality of cooperable receiving stations, also arranged in a line, and operative to receive reflected transmissions from said transmitting stations.

The transmitting and receiving stations may be arranged along a common line with each transmitting station being disposed adjacent to a cooperable receiving station or on suitably spaced lines with all transmitting stations being arranged to transmit beams of rays extending in a common radiation plane, and each receiving station being disposed to



receive return reflected radiation from the cooperable transmitting station, if desired with the use of suitable reflectors, at which receiving stations such radiation may be registered and analyzed.

Further, each transmitting station and the cooperable receiving station may be spaced a predetermined distance from each other, with each receiving station containing means for recording beams from several fixed directions, or the transmitting and receiving stations may be so disposed in conjunction with a plurality of beam dividers that the transmission beams and the received beams form a matrix-configurated network.

3,820,898

MULTI-CHANNEL RADIATION ANALYZER

Gaylord G. Olson, Santa Monica, Calif., assignor to SSR Instruments Company, Santa Monica, Calif.

Filed Aug. 30, 1972, Ser. No. 284,980

Int. Cl. G01j *3/36*

U.S. Cl. 356—82 **10 Claims**

An improved analyzer utilizes electron scanning techniques to examine the spectrum of radiant energy. A comparable spectrum of the background is provided, and the two are alternately scanned.

The spectrum can also be "folded" into a plurality of vertically aligned segments with an adjacent area of corresponding background spectra, and a conventional t v raster scan can be employed. Appropriate processing circuits subtract the background from the signal and store the result. Stored quantities can represent the intensity of incident radiation at each wavelength.

3,820,899

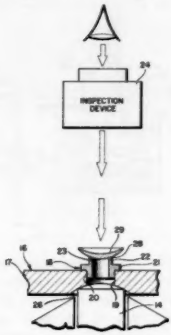
POWER AND SURFACE INSPECTION ADAPTOR PLATE

Harley G. McCormack, Elgin, Ill., assignor to American Hydrophilics Corporation, Elgin, Ill.

Filed Sept. 29, 1972, Ser. No. 293,477

Int. Cl. G01b *9/00*

U.S. Cl. 356—124 **3 Claims**



The embodiment of the invention disclosed herein is directed to a power and surface inspection plate to be adapted to conventional optical measuring instruments such as lensometers, biomicroscopes or the like. The adaptor plate is positioned in the viewing area of the optical measuring instrument and receives a flexible hydrophilic contact lens which is to have the lens power or surface thereof tested or inspected, respectively. An annular embossment is formed on the top side of the inspection plate. The embossment has an arcuately inwardly directed configuration at the upper annular edge thereof conforming substantially to the configuration of the convex surface of a contact lens to be placed thereupon.

3,820,900

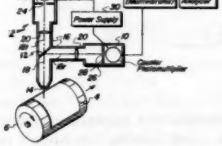
INSTRUMENT FOR SCANNING DOCUMENT FOR QUALITY

George T. Bauer, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 15, 1972, Ser. No. 315,734

Int. Cl. G01n *21/16, 21/32*

U.S. Cl. 356—200 **1 Claim**



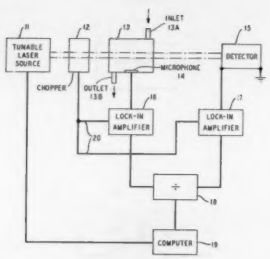
An apparatus to scan, detect, and count speckle or background "noise" on a surface such as a xerographic copy. The object surface is scanned simultaneously through a pair of apertures, one larger than the other. A photocell associated with each aperture provides an electrical pulse, proportionate in height to its illumination. Sufficient light from the copy surface through the larger (control) aperture signals its photocell to keep open a gate circuit. Simultaneously, a signal received through the smaller (counter) aperture is counted as "noise." If the control aperture and its photocell receive light below a certain threshold level, (as when a print character is scanned) the gate circuit is closed and signals from the counter aperture are not counted.

3,820,901

MEASUREMENT OF CONCENTRATIONS OF COMPONENTS OF A GASEOUS MIXTURE

Lloyd Barton Kreuzer, San Diego, Calif., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 6, 1973, Ser. No. 338,537
Int. Cl. G01j 3/42; G01m 21/22
U.S. Cl. 356—97 4 Claims



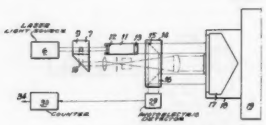
A technique for measuring the concentrations of each of the gases in a mixture of known gases. A laser source is first used to transmit monochromatic radiation at a number of wavelengths in turn through a known concentration of each of the gases expected in the mixture of gases separately and there is derived the absorption coefficients of each of these gases at each of these wavelengths. Thereafter, by measuring the absorption of the unknown mixture at these same wavelengths and by use of the derived absorption coefficients, there can be derived the concentrations of each of the gases in the mixture. By making measurements at more wavelengths than the number of known gases in the mixture, there can be provided warning as to the presence of unknown gases in the mixture.

3,820,902

MEASURING METHOD AND APPARATUS WHICH COMPENSATE FOR ABBE'S ERROR

Harumi Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1972, Ser. No. 243,035
Int. Cl. G01d 9/02
U.S. Cl. 356—106 9 Claims



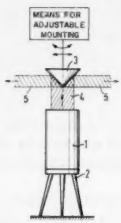
A measuring method and apparatus for measuring linear magnitudes while compensating for Abbe's error. A single laser unit measures a linear distance along an optical axis with a laser interferometer, this distance along the optical axis corresponding to an equal distance along a measuring axis which is parallel to and spaced from the optical axis by a given distance. Angular deviation of a body which moves along the optical axis to determine the measurement of the distance therealong produces at the measuring axis an error distance determined by the extent of angular deviation of the body and the distance between the optical and measuring axes. The extent of angular deviation of the body with respect to the optical axis is measured and converted by a detecting structure into compensating units which are of equal magnitude with units counted by a reversible counter in response to operation of the interferometer in order to determine the distance of movement of the body along the optical axis. The compensating units correspond to the error distance along the measuring axis resulting from angular deviation of the body at the optical axis, and these compensating units are added to or subtracted from the units counted during operation of the interferometer in order to achieve an accurate measurement which compensates for Abbe's error.

3,820,903

DEVICE FOR PRODUCING A LIGHT PLANE

Helmut Kindl, Muenchen, Germany, and Viktor Met, Palo Alto, Calif., assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Aug. 31, 1972, Ser. No. 285,217
Claims priority, application Germany, Sept. 1, 1971, 2143812
Int. Cl. G01b 11/27
U.S. Cl. 356—138 9 Claims



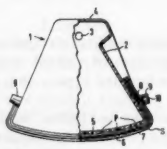
A device for producing a plane of laser light from a laser beam for use in controlling machines such as earth moving machines, rail adjusting machines, and rail directing machines characterized by a glass cone having a mirrored outer circumference to provide a conical reflecting surface arranged in a laser beam to reflect the beam as a plane of laser light. By adjusting the inclination of the axis of the cone with respect to the axis of the laser beam, the inclination of the plane of laser light with respect to the beam can be changed. By arranging the glass cone with its axis on the axis of the beam, a plane extending 360° from the device can be produced and if the axis of the cone is coaxial with the axis of the beam, the intensity of light extending in all directions is substantially equal. By offsetting the axis of the cone with respect to the axis of the laser beam, the laser beam can be converted to a plane of light extending from the device as an angular segment of less than 360°.

3,820,904

APPARATUS FOR APPLYING LIQUIDS TO THE SURFACE OF BODIES

Hans Boris Lindgren, Eskilstuna, Sweden

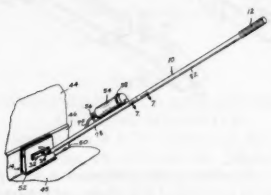
Filed Apr. 25, 1972, Ser. No. 247,332
Claims priority, application Germany, Apr. 30, 1971, 7116851
Int. Cl. A46b 5/02
U.S. Cl. 401—6 8 Claims



An apparatus for applying liquids to the surface of bodies, in the form of a liquid-receiving container which has substan-

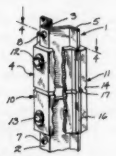
tially the shape of a four-sided truncated pyramid having a substantially rectangular base, to the perforated bottom plate of which are attached one or more layers of liquid-permeable material to which either a stencil or liquid-transferring means are attached, the upper portion of the container being constructed as a grip.

3,820,905
COMBINATION CLEANER, POLISHER AND WAXING DEVICE FOR WALLS AND FLOORS
Clarence R. Sims, Rt. 6, Box 121, Elkhart, Ind. 46514
Division of Ser. No. 120,136, March 2, 1971, Pat. No. 3,713,744. This application Sept. 28, 1972, Ser. No. 292,882The portion of the term of this patent subsequent to Jan. 30, 1991, has been disclaimed.
Int. Cl. A47l *13/312*
U.S. Cl. 401—140 **7 Claims**



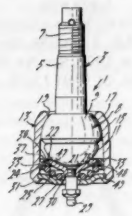
A combination cleaner, polisher and waxing device for walls and floors which includes an elongated handle having a pad carrier connected to the handle at one end thereof. One side margin of the pad carrier is weighted so as to permit the carrier to assume a generally vertical position for wall cleaning when held spacedly above the floor by the handle. The handle carries a liquid dispenser means which is connected by a conduit to the carrier and which serves to dispense a liquid into the pad of the carrier for use upon the wall or floor. The handle of the device is preferably of a two-piece construction which enables an auxiliary cleaning tool to be attached to the detachable handle piece when separated from the remainder of the handle.

3,820,906
HIGHWAY SIGN POST
Herbert L. Katt, 4107 Pennington Ln., Racine, Wis. 53403
Filed Aug. 10, 1972, Ser. No. 279,304
Int. Cl. F16b *7/00*
U.S. Cl. 403—2 **4 Claims**



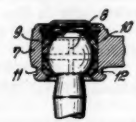
A channel post with its edges flanged outwardly is made in two vertically aligned sections, one of which is anchored in the ground. The sections are coupled together by a clamp in which one part is of channel shape to rigidly embrace the back and sides of the post sections and the other part is a frangible plate ground transversely in the general plane of the parting line between the post sections to induce breakage upon impact against the upper post section tensioning the same. Bolts extend through the back of the channel of each post section to secure the clamp parts together and the lower portion of the plate is friable to relieve the tension upon the lower bolt upon impact.

3,820,907
BALL JOINT
Morris Hassan, Trenton, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Filed June 4, 1973, Ser. No. 367,066
Int. Cl. F16c *11/06*
U.S. Cl. 403—27 **6 Claims**



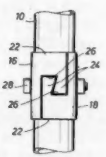
Ball joint suspension apparatus including an upper control arm and lower control arm connected by ball joints to a steering knuckle. One ball joint assembly includes a stud having a ball on one end mounted in a socket. A pressure plate is backed by a separate washer which is biased by a resilient member. The plate engages the ball and keeps it in contact with the socket as the socket and ball wear. A retainer located in the socket limits the amount of movement of the separate washer.

3,820,908
ELASTIC BALL-JOINT
Gottfried Maxeiner, Dusseldorf-Kaiserswerth, and Heinrich Muhr, Dusselford, both of Germany, assignors to A. Ehrenveich & Cie, Dusseldorf, Germany
Filed July 15, 1971, Ser. No. 162,770
Int. Cl. F16c *11/06*
U.S. Cl. 403—133 **4 Claims**



An elastic ball joint, in particular for steering rods of automatic vehicles, wherein the joint has different elasticities in both main load directions.

3,820,909
FENCE FITTINGS
Leon A. Schindler, and Raymond G. Schindler, both of P.O. Box 19128, Houston, Tex. 77024
Continuation of Ser. No. 95,298, Dec. 4, 1970, abandoned. This application Sept. 26, 1972, Ser. No. 292,431
Int. Cl. F16b *7/04*
U.S. Cl. 403—205 **12 Claims**



Fence fittings for securing together various fence supporting members such as posts and rails formed of pipe and for at-

taching hinges and latches to gates, the fittings being formed in two identical or counterparts having end portions shaped to claspingly fit the fence members and formed with interfitting ends positioned for interlocking engagement when assembled to hold the parts in registration and prevent the end portion from being separated.

3,820,910

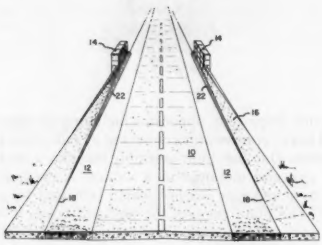
VEHICLE REDIRECTION CONFIGURATION

James A. Morrett, Jr., R.D. 4 Box 986, Harrisburg, Pa. 17112

Filed Feb. 6, 1973, Ser. No. 329,989

Int. Cl. E01f *15/00*

U.S. Cl. 404—6 **5 Claims**



This invention relates to a structure for use along vehicular roadways for the purpose of redirecting vehicles which have strayed off the side edges of the roadway. A configuration is provided which will redirect vehicles along a path to avoid collision with the ends of parapet walls, piers, or other hazards located along such roadways.

3,820,911

MARKING OF CARRIAGEWAYS

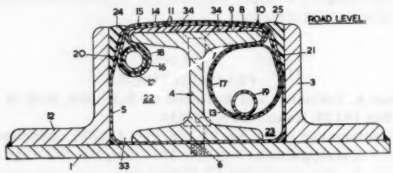
Philip Arthur Bays, Guildford, England, assignor to Secretary of State for the Environment in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 23, 1973, Ser. No. 335,176

Claims priority, application Great Britain, Feb. 25, 1972, 8720/72

Int. Cl. E01f *9/00*

U.S. Cl. 404—11 **18 Claims**



A variable carriageway marker comprises an elongated platform located below the carriageway surface and on which a flexible sleeve extends longitudinally, the sleeve comprises a laterally intermediate part incorporating a marking portion and located above the platform, and parts on either side of the intermediate part, each defining loops located below the carriageway surface. The marker is provided with means whereby the relative sizes of two or three of the parts of the sleeve can be varied to move the carriageway marking portion of the sleeve relative to the carriageway surface to vary the carriageway marking. The intermediate part of the sleeve may include a carriageway surface level marking, or may be enlargeable to form a raised carriageway marking.

3,820,912

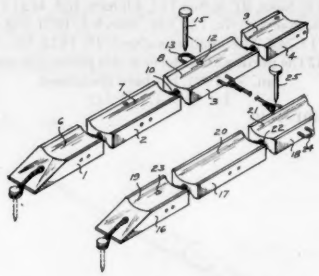
MOBILE COLLAPSIBLE RAMP

Jack Thomas Hughes, Powell River, B.C., Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 10, 1972, Ser. No. 305,524

Int. Cl. E01c *5/16*

U.S. Cl. 404—35 **7 Claims**



A mobile collapsible ramp comprises a first plurality of blocks coupled to each other in a chain and removably affixed to the ground. A second plurality of blocks are coupled to each other in a chain and are removably affixed to the ground in spaced substantially parallel relation to the first plurality of blocks. Each of the blocks has a substantially resilient undersurface and an upper surface for accommodating a vehicle wheel.

3,820,913

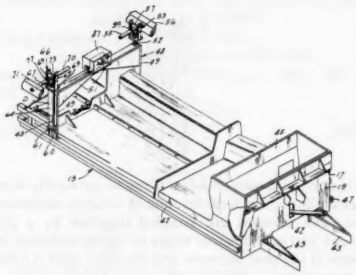
CURB AND GUTTER FORMING MACHINE

Harold E. Miller, and Robert E. Miller, both of Milwaukee, Wis., assignors to Curbmaster of America, Inc., Cedar Falls, Iowa

Continuation of Ser. No. 80,925, Oct. 15, 1970, abandoned. This application Sept. 13, 1972, Ser. No. 288,687

Int. Cl. E01c *11/28*

U.S. Cl. 404—98 **14 Claims**



Self-propelled curb and gutter forming machine mounted on continuous traction devices and drawing a mold for the curb and gutter between the traction tread devices. The main frame of the machine is suspended on one side from the trac-

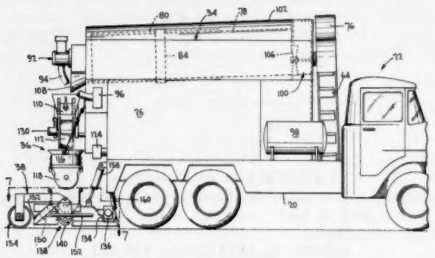
tion tread devices on two longitudinally spaced jacks transversely pivoted to the traction tread devices and conforming the main frame to the grade of the roadway. The main frame is suspended from the opposite continuous traction tread device on a support, transversely pivoted to the tread device and having supporting connection with the main frame above the tread device. This support may be vertically adjusted. The mold form is vertically pivoted at its front end to a draw bar at the front of the main frame. The pivot is sufficiently loose to accommodate transverse tilting of the mold form relative to the main frame. The rear end of the mold form is suspended from the main frame to move laterally about the axis of the vertical pivot and to tilt about one side of the mold form. The suspension from the main frame to the mold form includes a fluid pressure jack operable to tilt the mold form in accordance with the transverse slope of the roadway.

3,820,914

SELF-CONTAINED MOBILE ASPHALT MIXING AND APPLYING APPARATUS

Harold M. Zimmerman, R.D. No. 1, Ephrata, Pa. 17522

Filed Sept. 14, 1972, Ser. No. 288,987
Int. Cl. E01c *19/12*
U.S. Cl. 404—110 **19 Claims**



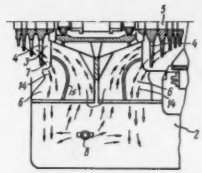
A bituminous concrete mixing and applying apparatus is disclosed which is constructed in an entirely self-contained and mobile fashion whereby bituminous concrete can be mixed and applied at the job site. The apparatus comprises an elongated mobile frame, such as a truck frame, upon which storage compartments are disposed for separately storing aggregates such as sand, stone, gravel, and the like, as well as liquid bitumens, such as asphalt, tar, or the like. A conveyor means is provided beneath the storage compartments for the aggregates for conveying such aggregates out from the storage compartment through a metering device and into a heating and drying mechanism whereat the aggregates are heated, dried and agitated. The dry aggregates as well as the liquid bitumens which similarly have been heated are discharged into a discharge mechanism or hopper assembly disposed on the mobile frame whereat bituminous concrete is formed. This bituminous concrete is applied to an underlying road surface to provide a covering commonly termed macadam, blacktop, or asphalt, by means of a spreader mechanism which, in the preferred inventive embodiment, constitutes a heating chamber, a plurality of spreading auger conveyors, a vibrator, and a roller compactor. In essence, the instant invention constitutes a mobile bituminous concrete plant which can be sent directly to a job site to mix and apply the bituminous concrete.

3,820,915

EXHAUST PIPE OF A STEAM TURBINE

Petr Sergeevich Chernyshev, Prospekt Engeksa, 22 kv. 219; Konstantin Alexeevich Spiridonov, Sredneokhtinsky prospekt, 26/17, kv. 88; Vladimir Alexandrovich Pakhomov, ulitsa Tukhachevskogo, 35, kv. 53; Viktor Kuzmich Ryzhkov, Bolshaya Porokhovskaya ulitsa, 41, kv. 71; Petr Stanislavovich Gladkovsky, ulitsa Tavricheskaya, 45, kv. 10; Viktor Semenovich Shargorodsky, ulitsa Zamshina, 50, kv. 217; Georgy Vasilievich Nikolafv, ulitsa Gerasimovskaya, 15, kv. 131; Izrail Mordukhovich Volfson, ulitsa Granitnaya, 46, korpus I, kv. 54; Boris Leonidovich Levchenko, ulitsa Tukhachevskogo, 35, kv. 16, all of Leningrad, U.S.S.R., and Alexandr Nikolaevich Shlyapin, deceased, late of prospekt Tukhachevskogo, 35, kv. 46, Leningrad, U.S.S.R. (by Tatyana Ivanovna Davidovich, administrator)

Continuation of Ser. No. 187,268, Oct. 7, 1971, abandoned.
This application Mar. 6, 1973, Ser. No. 338,723
Int. Cl. F01d *5/00*
U.S. Cl. 415—116 **1 Claim**



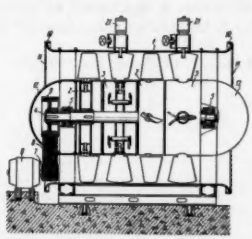
An exhaust pipe of a steam turbine having channels for providing communication between the condenser steam space and the zone of root sections of the moving blades of the rotor final stages, and provided in the condenser steam space with a header having nozzles for the supply of the cooling steam-water mixture to the condenser zone adjoining the channels.

3,820,916

AXIAL-FLOW REVERSIBLE FAN

Vladimir Alexandrovich Agushev, ulitsa Sadovaya, 8, kv. 1, Artemovsky Sverdlovskoi oblasti; Iosif Veniaminovich Brusilovsky, Fortunatovskaya ulitsa, 33/44, kv. 76, Moscow; Alexandr Mikhailovich Gamajunov, ulitsa Kozlova, 3, kv. 111, Solegorsk Minskoi oblasti; Konstantin Vasilievich Lanchikov, ulitsa Akademika Koroleva, 9, korp. 2, kv. 179, Moscow; Jury Moiseevich Sosner, ulitsa Chkalova, 27, kv. 58, Moscow; Veniamin Yakovlevich Tsodikov, ulitsa Gilyarovskogo, 33, kv. 47, Moscow, and Sergei Sergeevich Judochkin, ulitsa Radistov, 5, kv. 2, Artemovsky Sverdlovskoi oblasti, all of U.S.S.R.

Filed May 12, 1972, Ser. No. 252,745
Int. Cl. F01d *1/30, 17/14*
U.S. Cl. 415—152 **3 Claims**



The axial-flow reversible fan disclosed consists of a sectional housing mounting impellers which produce an air flow during the operation of the fan. Disposed steamwise inside the

housing is a device for straightening and guiding the air flow equipped with rotaty guide blades. The latter have a concavo-convex aerodynamical profile in the passage section and have a trapezoidal shape in the non-passage section, the major base of said trapezium being made along the radius of the fan, while the chords are equal to $2\pi R/Z$, where R is the radius varying within the length of the rotary guide blade and Z is the number of these blades. The rotary guide blades through their tails are connected to the mechanism which provides for turning the blades through an angle close to 180°.

3,820,917

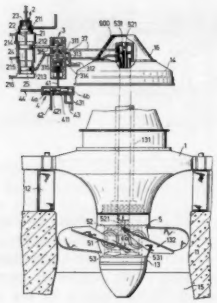
SAFETY DEVICE FOR PREVENTING THE EXCESSIVE SPEED OF WATER TURBINES

Savo Rakcevic, Ljubljana, Yugoslavia, assignor to Titovi Zovodi Litostroj, Ljubljana, Yugoslavia

Filed Oct. 10, 1972, Ser. No. 296,089

Int. Cl. F01d *7/00*

U.S. Cl. 416—157 **4 Claims**



A safety-valve for preventing the overspeed of an hydraulic-turbine runner has passages communicating between the servo-control valve and the servomotor which varies the position of the pivotal vanes of the runner. The safety-valve member leaves the passages unobstructed in its normal position and is hydraulically biased into this position by a substantially constant pressure which is relieved upon the development of overspeed and a slight displacement of the valve member under the hydraulic pressure resulting therefrom to substantially instantaneously drive the valve member into an opposite position in which the flow paths are blocked and fluid displacement to or from the servomotor is made independent of the control valve and such that the blades pivot into an open position.

3,820,918

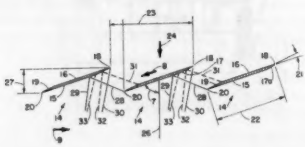
SUPERSONIC FAN BLADING

Arthur W. Goldstein, Shaker Heights, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 21, 1972, Ser. No. 219,806

Int. Cl. F01d *5/14*

U.S. Cl. 416—223 **2 Claims**



Radially extending rotor blades are disposed on a hub to form a supersonic propulsion fan for a turbofan engine. The peripheral spacing of the blades is such as to avoid forming a channel or passageway between adjacent blades. Each blade has a flat trailing surface extending from the leading edge at least as far to the rear as to cause any pressure waves which might originate on the blade surface to strike the leading surface of the following blade rather than propagate upstream of the blade row. The flat trailing surface of each blade makes an angle with the axis of rotation such that the blade is parallel to a gas inflow into the blades.

3,820,919

ZIRCONIUM-CARBON GETTER MEMBER

Helmut Katz, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Dec. 13, 1971, Ser. No. 207,022

Claims priority, application Germany, Dec. 21, 1970, 2062992

Int. Cl. F04b *37/00*

U.S. Cl. 417—48 **1 Claim**

A getter member comprised of an open-ended container composed for example of molybdenum or carbon, having a sintered porous mass composed of a mixture of zirconium and up to about 30 percent by weight carbon therein. The getter member is non-evaporable and operable at room temperatures so as to be positionable at any desired location within an electric discharge tube. Means for securing the getter material within its container is also disclosed.

3,820,920

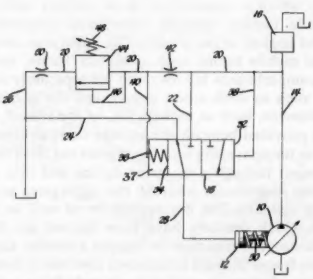
POWER TRANSMISSION

Richard A. Klimaszewski, Warren, and Kenneth Court, Detroit, both of Mich., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Dec. 18, 1972, Ser. No. 315,944

Int. Cl. F04b *49/00*

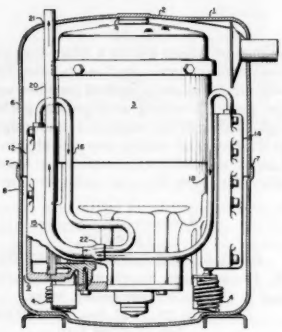
U.S. Cl. 417—213 **3 Claims**



A pressure regulated variable displacement pump has a pilot operated servomotor controlled by a pilot valve which is responsive to pump outlet pressure through the medium of a continuous flow bleed circuit containing a pilot relief valve.

Two fixed orifices are provided in the bleed circuit, one ahead of the control chamber of the pilot valve and one beyond it which together make the pilot valve responsive not only to pressure changes in the pump output, but also to the first derivative or rate of change of such pressure.

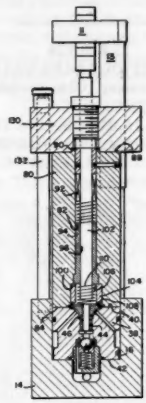
3,820,921
TUNED EXHAUST FOR HERMETIC COMPRESSOR
Paul G. Thayer, Staunton, Va., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 14, 1971, Ser. No. 207,900
Int. Cl. F04b *39/00*
U.S. Cl. 417—312 **7 Claims**



This invention relates to a discharge arrangement for a hermetic compressor having at least two radially spaced cylinders within the compressor casing. Each cylinder is provided with a respective single discharge tube within the compressor casing. Each of the single discharge tubes is connected in a group at a common joint to a respective common discharge tube. The common joints are positioned at a point relative to the dimensions of the single discharge tubes and to the radial positions of their respctive cylinders such that the discharge pulses in the common discharge lines are evenly spaced which helps to increase the compressor efficiency and also minimizes the need for a muffler. The single discharge tubes are flexible in the assembled relationship and may be arranged in a side-by-side relationship at the common joint to cause an aspiration effect therein, thereby increasing the volumetric efficiency of the compressor.

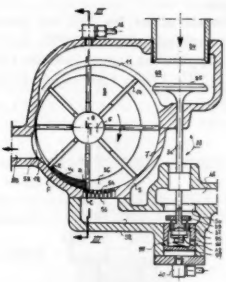
3,820,922
MULTIPLUNGER RECIPROCATING PUMP
Frederic W. Buse, 4115 Knauss Cir., Allentown, Pa. 18104, and Warner E. Sensinger, Jr., 515 Fernwood, Emmaus, Pa. 18018
Division of Ser. No. 257,588, May 30, 1972. This application Dec. 3, 1973, Ser. No. 421,214
Int. Cl. F04b *23/06*
U.S. Cl. 417—539 **5 Claims**

A multiplunger reciprocating pump having a cylinder head with internal manifolding and valving arrangement that permits removal of valves as units from selected pumps, valve bodies with bias porting, and studs in constant tension. A sole-



noid actuated rod may be added to unload the compression chambers by inhibiting the inlet or suction valve from seating.

3,820,923
SINGLE-STAGE OR MULTISTAGE ROTARY COMPRESSOR
Antonio Zweifel, Zurich, Switzerland, assignor to Airfina Etablissements, Vaduz Liechtenstein, Switzerland
Filed Oct. 27, 1972, Ser. No. 301,558
Claims priority, application Switzerland, Dec. 1, 1971, 17508/71; July 7, 1972, 10182/72
Int. Cl. F01c *21/04*
U.S. Cl. 418—84 **24 Claims**



A rotary compressor with injection of the cooling medium into a compression chamber is characterized by having a rotary compression means journaled in a housing. The compression means is adapted to compress the fluid along a compression path from a fluid inlet to a fluid outlet. A plurality of nozzles inject the cooling medium into the compression chamber along a portion of the compression path. The smallest cell volume v_1, into which the cooling medium is still being injected and the smallest closed cell volume v_2, of the compressor exhibits the relation:

$$-0.40 \leq \psi \leq +0.60$$

where

$$\psi = v_1 - v_2/v_2.$$

In one embodiment, the number of cooling medium inlet nozzles are over 20 per compression path, the ratio of length to

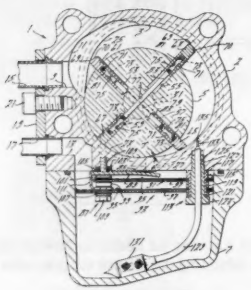
width of a nozzle orifice exceeds 10, its minimum width is less than 0.1 $\sqrt{F}$, where F denotes the sum of the cross-sectional areas of the nozzles.

3,820,924

ROTARY VANE REFRIGERANT GAS COMPRESSOR

Harry J. Cassidy, Kettering, Ohio, assignors Chrysler Corporation, Highland Park, Mich.

Filed Dec. 15, 1972, Ser. No. 315,706
Int. Cl. F01c *21/04*; F04c *29/02*; B01d *19/00*
U.S. Cl. 418—89 10 Claims



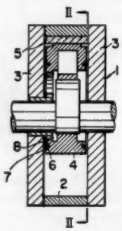
Rotary vane compressor having a plurality of radially directed vanes. The vanes are movable and are biased toward engagement with a cavity surface. An oil sump containing a separator assembly is attached to the rotor housing.

3,820,925

OIL SEAL DEVICE FOR ROTARY PISTON INTERNAL COMBUSTION ENGINE

Yoshio Uchiyama, and Noriyuki Kurio, both of Hiroshima, Japan, assignors to Toyo Koygo Company Limited, Hiroshima, Japan

Continuation-in-part of Ser. No. 267,723, June 29, 1972, abandoned. This application Sept. 7, 1973, Ser. No. 395,117
Claims priority, application Japan, June 29, 1971, 46-56727
Int. Cl. F01c *19/00*; F04c *15/00, 27/00*
U.S. Cl. 418—142 9 Claims



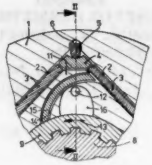
In rotary piston internal combustion engines comprising a center housing having a trochoidal inner peripheral surface, side housings provided at both sides of said center housing forming axial thrust surfaces and a three apexed rotary piston provided on an eccentric shaft within a casing formed by said center and side housing for rotation about the shaft axis. Oil seal devices having an annular oil seal ring and an O-ring and an annular oil seal groove and an annular spring are provided on the thrust surfaces of said rotary piston. Two portions of the spring secure itself elastically and the oil seal ring in the circumferential direction within the annular oil seal groove in order to prevent relative slippage between said piston and the oil seal ring within the groove.

3,820,926

SEALING ARRANGEMENT FOR A COMBUSTION ENGINE WITH A ROTARY-TYPE PISTON

Peter Hofbauer, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Sept. 27, 1972, Ser. No. 292,753
Claims priority, application Germany, Sept. 28, 1971, 2148254
Int. Cl. F01c *19/12*; F04c *27/00*
U.S. Cl. 418—144 6 Claims



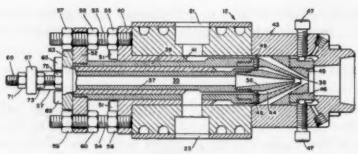
In a combustion engine having a rotary-type piston mounted for rotation on an eccentric shaft in a housing having at least a pair of side members and a central member surrounding the rotary-type piston, a sealing arrangement performing the oil and gas-tight sealing of the respective operating spaces and including at least an axial sealing strip provided in the side members and an oil removing strip provided at least in one of the side members for aiding the axial sealing strip in performing its function.

3,820,927

DUAL LAYER CROSSHEAD SYSTEM

Vasken R. Toomajanian, Needham, Mass., assignor to Boston Insulated & Cable Co., Dorchester, Mass.

Filed June 29, 1972, Ser. No. 267,585
Int. Cl. B29f *3/10*
U.S. Cl. 425—113 7 Claims



A dual layer extrusion crosshead having internal tooling arranged to provide lengths of concentric annular composite layers. The two layers, which can be rubber or rubber-like, thermoplastic or thermosetting or other extrudable materials, either similar or dissimilar, are fed into the crosshead by two different extrusion machines. After the material flows into the crosshead from either extrusion machine, the material is diverted around a mandrel and converted into an annulus discharging portion at a nozzle which is adjustable to obtain a uniform radial thickness. The next layer from a second extruder is diverted around a second mandrel positioned coaxially about the inner mandrel and the material is converted into a second annulus formed about the inner annulus. Its thickness is also adjustable.

The outer layer is molded to the inner layer just before the composite leaves the exit die. The mandrel and flow control system is convertible such that the inner annular layer can be formed from material from either extrusion machine. Thus, composite dual layers can be generated for application to an electric conductor or cable or other core or a coreless tube may be formed. The relative thickness of each layer may be regulated by the speed of each extrusion machine which can be electrically coordinated for uniform thickness control over any desired speed range.

3,820,928

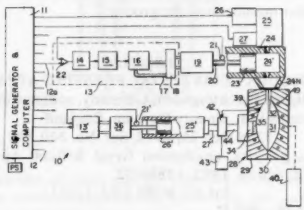
CONTROL SYSTEM FOR MOLDING

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation of Ser. No. 849,014, Aug. 11, 1969, abandoned, which is a continuation-in-part of Ser. No. 721,401, April 15, 1968, Pat. No. 3,616,495, which is a continuation-in-part of Ser. No. 421,860, Dec. 29, 1964, abandoned, which is a continuation-in-part of Ser. No. 421,817, Dec. 29, 1964, Pat. No. 3,462,594, which is a continuation-in-part of Ser. No. 439,549, March 15, 1965, abandoned, which is a continuation-in-part of Ser. No. 734,340, May 9, 1958, Pat. No. 3,173,175. This application Oct. 13, 1972, Ser. No. 297,452The portion of the term of this patent subsequent to Nov. 2, 1988, has been disclaimed.

Int. Cl. B29f *1/06*

U.S. Cl. 425—146 11 Claims



A control system is provided for molding articles of manufacture of molten molding materials such as thermoplastic resins, metals and the like which solidify in situ within a mold cavity after sufficient heat is transferred therefrom and the material sets. The control system may be operated to predeterminately vary the rate of flow of molding material to the cavity of a mold during a molding cycle so as to permit optimization of the structure of the molding material which may not occur if the molding material is fed at a constant rate or at a rate which varies uncontrollably. The control system may also be utilized to control other variables associated with the molding operation including the flow of a decorating material to the mold.

3,820,929

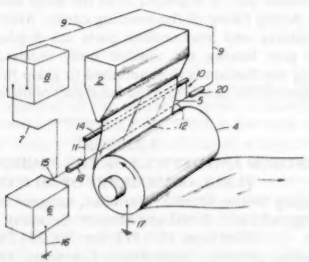
ELECTROSTATIC PINNING OF POLYMERIC FILM

Joseph B. Busby, Central, and Robert K. Dotson, Greenville, both of S.C., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 14, 1972, Ser. No. 315,271

Int. Cl. B29d *7/22*

U.S. Cl. 425—174.8 E 10 Claims



An apparatus and a process for holding a thermoplastic polymer film upon a moving surface by electrostatic means. A first, electrically charged, electrode, spaced in close proximity to the moving surface, which is grounded, provides an electrostatic charge pinning the film to the moving surface. A second non-corona producing electrode, maintained at an electrical potential equal or close to the electrical potential imposed upon the first electrode, and disposed further away from the moving surface than the first electrode, focuses the electrostatic charge holding the film to the moving surface.

3,820,930

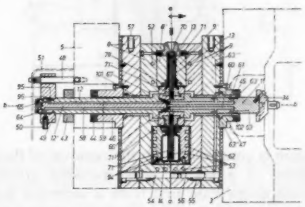
DEVICE FOR THE PRODUCTION OF PLASTIC BOTTLES BY INJECTION BLOW MOLDING

Karl Hehl, Siedlung, 7231 Lossburg/Wuerttemberg, Germany

Filed June 2, 1972, Ser. No. 259,279

Int. Cl. B29f *23/03*

U.S. Cl. 425—242 B 12 Claims



A device for the production of bottles of thermoplastic material in an injection and blow-forming process where in a compound die a row of bottles is premolded around cores in the injection molding portion of the die, while simultaneously a row of premolded bottles is blow-formed to final shape in the blow molding portion of the die, the cores also serving for the transfer of the premolded bottles. The molds and core rows are so arranged and diametrically aligned that a core carrier mounted on a shaft extending through the die at right angles to the die separation plane accomplishes the core transfer by a 180° rotation.

3,820,931

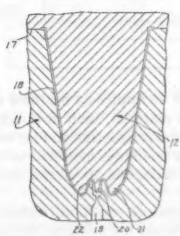
INJECTION MOLD FOR PRODUCING OPEN-MOUTHED THIN-WALLED CONTAINERS HAVING MEANS TO PREVENT RADIAL DEFLECTION OF THE MALE MOLD PART

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 214,166, Dec. 30, 1971, abandoned. This application Nov. 20, 1972, Ser. No. 308,200

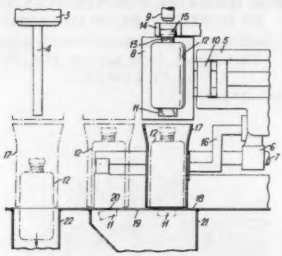
Int. Cl. B29f *1/00*

U.S. Cl. 425—242 R 1 Claim



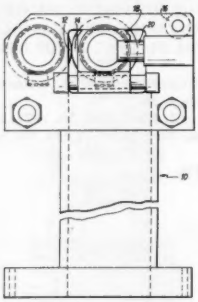
The apparatus and process for injection molding relatively thin walled and relatively deep hollow plastic articles with accurately controlled wall thicknesses.

3,820,932
BLOW MOULDING
Victor Worthington, Wokingham, England, assignor to Bone Cravens Limited, Yorkshire, England
Filed Mar. 29, 1972, Ser. No. 239,041
Claims priority, application Great Britain, Apr. 6, 1971, 8859/71
Int. Cl. B29d *23/03*
U.S. Cl. 425—302 B **2 Claims**



The invention is concerned with the removal of flash from the flat bottom of a hollow blow moulded article. The moulded article drops base first from a sectional mould in which it has been moulded onto a supporting surface having a slot into which the flash projects. The bottle is moved relatively to the supporting surface so that the flash is sheared off by a stationary knife at the end of the slot.

3,820,933
TREATMENT OF FILMS OF PLASTICS MATERIAL
Frank Metcalf Aspin, Knutsford, England, assignor to Shell Oil Company, New York, N.Y.
Filed June 15, 1972, Ser. No. 263,162
Claims priority, application Great Britain, June 17, 1971, 2833/71
Int. Cl. B29c *15/00*
U.S. Cl. 425—367 **7 Claims**

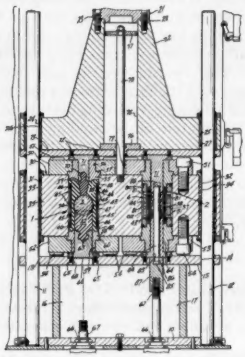


There is disclosed an improved machine suitable for treating films of plastics material, such as polypropylene, so that the film, after its initial production and before stretching, is on passing through the machine, modified so as to make it, on stretching, readily reducible to strand form of a required cross-section.

Basically the improved machine includes a pair of cooperating rollers, means for bringing the rollers together to form a nip through which such a film of plastics material may pass, means for adjusting the nip pressure, means for rotating each of the rollers at selected speeds, means for controlling the temperature of the rollers, and peripheral formations on at least one of the rollers whereby the film on passing through the nip may have its cross-sectional shape modified to provide alternately across its width enlarged portions from which strand forms will be produced, and portions of reduced thickness which serve to preserve the transverse continuity of the film for the time being.

Also disclosed are various roller constructions. In one construction there is a stationary cylindrical support, a close-fitting annular rotor carried thereby, generally axial cavities being provided between the two, and means for circulating cooling or heating liquid through certain cavities in one direction and through other cavities in the other direction. The rotor may be supported on the support for rotation by a hydrostatic bearing arrangement. One feature of this can consist in the use of axial cavities to carry bearing liquid and thereby give radial support. For axial bearing support there may be provided, on the support, an annular portion of enlarged diameter which fits in a groove in the rotor, passages being provided to supply bearing liquid between the sides of the annular member and the groove.

3,820,934
PARTICULATE MATERIAL PRESSING APPARATUS
Anton Stigler, Berchtesgaden, Germany, assignor to Olin Energy Systems Ltd., County Durham, England
Filed Oct. 25, 1972, Ser. No. 300,535
Claims priority, application Great Britain, Apr. 6, 1972, 15888/72; Apr. 6, 1972, 15889/72
Int. Cl. B30b *5/02, 11/02*
U.S. Cl. 425—405 H **10 Claims**

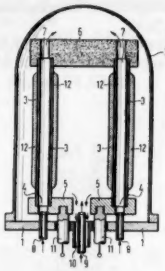


Apparatus for isostatically pressing particulate material into coherant bodies. The molding body includes three parts, a basal part, an intermediate part and a top closure part. The top closure part is displaced from the basal and intermediate parts during filling of the molding cavity. After molding, the top closure and intermediate parts are displaced from the basal part leaving the molded body exposed thereon. A gripper mechanism is then actuated to grasp the molded part and remove the latter from the basal part of the mold body.

3,820,935
METHOD AND DEVICE FOR THE PRODUCTION OF TUBULAR MEMBERS OF SILICON
Wolfgang Dietze, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Sept. 25, 1972, Ser. No. 291,787
Claims priority, application Germany, Oct. 4, 1971, 2149526
Int. Cl. B29c *13/00;* **C23c** *13/08*
U.S. Cl. 425—447 **5 Claims**

A method and device for the production of silicon tubes by deposition of self-supporting silicon layers from the gas-phase

onto tubular heated carriers of graphite whereby two such vertical carriers are supported along the periphery of their lower ends by electrodes and are connected at their upper ends by a bridge of conductive material, whereby the tubular shaped carriers, as well as the supporting electrodes and the connecting bridge are so designed with respect to each other that the respective values for the product of the shortest circum-



ference with the smallest current carrying cross-section and the specific conductivity for the electrodes and connecting bridge are at least five times, preferably ten times as large as the values of such products for the tubular carriers, and stopping the production of such layers when the temperature differential between the tubular carriers and the supporting elements, i.e., electrodes and connecting bridge, drops to 300°C.

3,820,936

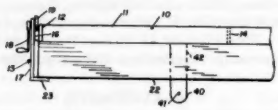
WALL SURFACING DIE WITH SUPPORT AND MOVING MEANS

Albert Kirsch, 7201 Old Watesburg Rd., Erie, Pa. 16510

Division of Ser. No. 48,089, June 22, 1970, Pat. No. 3,692,458. This application Sept. 18, 1972, Ser. No. 289,842

Int. Cl. B29c *5/08*

U.S. Cl. 425—469 **2 Claims**



This application discloses a process for forming a layer of masonry-like material on the outside of walls or panels. The process is carried out by using a die which is the same size as the area to be coated. The die is made up of a rigid outside frame with partitions extending between the sides and the ends of the frame. The partitions are rectangular in cross section and are laid out in a pattern which defines the outline of a masonry block of a constructed wall of brick or stone. The material of the partitions have the same thickness as the material to be placed on the wall and the frame of the die is provided with clamps in one embodiment of the invention. The clamps are suitable for clamping it to the panel. In another embodiment of the invention, the die may be supported on suitable supports and lowered into the material after it is placed on the panel or wall.

3,820,937

ELECTRIC FLASH BULB FOR USE AS INDICATOR

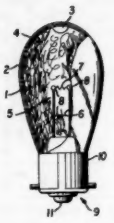
Kenji Ohmae; Hidehiro Shinada, and Hisashi Nikkawa, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Company Limited, Ken, Japan

Filed Apr. 10, 1972, Ser. No. 242,398

Claims priority, application Japan, Apr. 10, 1971, 46-22583; Apr. 10, 1971, 46-27105

Int. Cl. F23d *5/12*

U.S. Cl. 431—13 **8 Claims**



Mixture agents consisting of mixed coloring agents and oxidizing agents are enclosed in a light pervious envelope of glass or similar material of an electric flash bulb. The coloring agents thereof are adhered to the inside wall of the flash bulb by ignition of combustible material within the bulb, whereby the envelope of the flash bulb is colored and may be used as an indicator in the maintenance of certain equipment.

3,820,938

CIRCUIT ARRANGEMENT FOR FUEL HEATING DEVICE

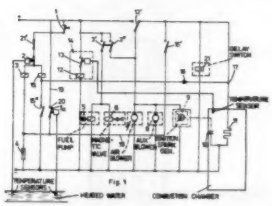
Gerhard Delf, and Gunther Schommarz, both of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsberg, Germany

Filed Feb. 29, 1972, Ser. No. 230,269

Claims priority, application Germany, Mar. 1, 1971, 2109585

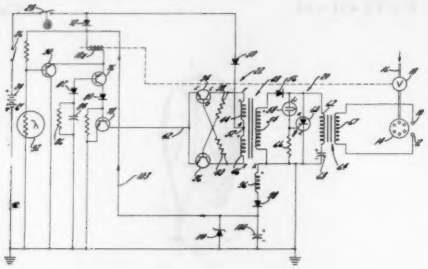
Int. Cl. F23n *5/00*

U.S. Cl. 431—78 **8 Claims**



Disclosed is a protective circuit for a liquid fuel heating device, particularly in a motor vehicle, comprising a master switching relay for controlling respective operating means of the heating device, a disturbance detecting switch responsive to the fuel ignition temperature and controlling a contact from normal position to an actuating position at which a glow plug in the heating device is discontinued, and a protecting branch circuit including a fuse connected in series with the relay coil of the marker switch, and a protecting contact closing in response to the actuation of the disturbance detecting contact for connecting the fuse to the normal position contact of the disturbance detecting switch, thereby protecting the heating device when the combustion process is interrupted.

3,820,939
ELECTRONIC IGNITION SYSTEM
William F. McKenna, Rockford, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.
Filed Dec. 8, 1972, Ser. No. 313,259
Int. Cl. F23n 5/08
U.S. Cl. 431—79 13 Claims

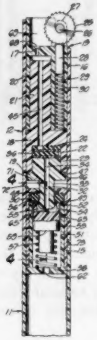


An electrical control system for turning on a solenoid valve to supply fuel to a burner, and wherein the valve remains on only if ignition of fuel occurs within a predetermined time as a consequence of a cojointly controlled igniting spark device. The system energizes a circuit for generating high voltage sparking potential and automatically drops out the circuit when ignition occurs or fails to occur within a predetermined time. The system is particularly adapted for use with a direct current source of limited energy storage capacity and includes features which minimize power consumption during operation.

3,820,940
IGNITOR ASSEMBLY FOR A PERCUSSIVE TYPE PHOTOFLASH LAMP
Bruce T. Buzalski, Dover; Bernard Chauvin, Cedar Grove, both of N.J., and Henry G. Lay, Bath, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 21, 1972, Ser. No. 317,333
Int. Cl. F41h 9/02
U.S. Cl. 431—93 5 Claims

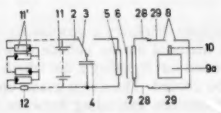
The anvil component of the ignitor assembly for a percussive type photoflash lamp is provided with segments of different diameter — both of which are smaller than the inside diameter of the hollow metal tube. The smaller-diameter segment of the anvil is supported in centralized position within the tube by a noduled terminus and by four splines that protrude from the larger-diameter segment. The spacing between the smaller-diameter segment and the metal tube is thus increased and premature ignition of the primer material on the anvil during lamp manufacture and subsequent operations is prevented. Forming the splines from a larger-diameter segment of the anvil also provides greater control of the spline dimensions and, thus, better positioning of the anvil within the tube.

3,820,941
LIGHTER CONSTRUCTION
Rodney S. Piffath, Northridge, and John J. Cole, Beverly Hills, both of Calif., assignors to International Fire Tool Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 317,529, Dec. 22, 1972, abandoned. This application May 18, 1973, Ser. No. 361,553
Int. Cl. F23q 2/16
U.S. Cl. 431—254 13 Claims



A lighter has a reservoir containing fuel under pressure and a valve to prevent escape through an opening in the reservoir. An ignition member equipped with a pressure-reducing regulator has a hollow cylindrical projection movable through the opening to open the valve. An elastomeric O-ring in the opening cooperates with the valve to prevent escape of fuel and also cooperates with the projection to seal against leakage when the valve is open.

3,820,942
GAS LIGHTERS
Hermann Remy, Dietzenbach-Steinberg, Germany, assignor to Rowenta Werke GmbH, Offenbach am Main, Germany
Filed Mar. 20, 1973, Ser. No. 343,065
Claims priority, application Germany, Mar. 23, 1972, 2214136
Int. Cl. F23q 2/16
U.S. Cl. 431—255 36 Claims



In accordance with this invention there is provided an electrically ignited gas lighter comprising an energy source and a hand lighter which is detachably connectable to the energy source. The hand lighter includes a source of gas, a gas valve, a gas burner and an ignition spark gap for providing a spark upon the application of an ignition voltage thereto to ignite gas issuing from the gas burner. The energy source includes means for generating an ignition voltage for application to the

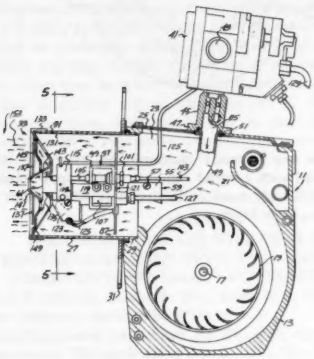
ignition spark gap. Means are provided in the lighter for opening the gas valve and subsequently establishing a spark across the ignition spark gap upon detachment of the hand lighter from the energy source and for closing the gas valve upon return of the hand lighter to the energy source.

3,820,943

POWER BURNER

Warren H. De Lancey, Elyria, and Myron T. Cooperridge, North Royalton, both of Ohio, assignors to R. W. Beckett Corporation, Elyria, Ohio

Filed May 26, 1972, Ser. No. 257,110
Int. Cl. F23q *3/00*; **F23c** *7/00*
U.S. Cl. 431—265 **21 Claims**



A power burner for fluid hydro-carbons whose blower housing has a chamber outletting to an air tube mounting a burner head. A tube delivers gas from a manifold extending into said chamber and axially to said burner head. An air restricting static disc perforated throughout is mounted on the gas tube adjacent said chamber building up air pressure therein and creating a uniform air flow through said air tube at reduced velocity. The gas tube is apertured in said chamber and with a scoop, receives primary air to mix with the gas passing through said gas tube. A pilot flame assembly is mounted in the air tube adjacent the burner head and a pilot air intake tube delivers primary air from said chamber to stablize the pilot flame. The burner head assembly includes a concave centrally apertured plate receiving the gas tube and having radially extended slots therethrough to deliver uniform streams of air. A concave diffuser cap forwardly of said plate reverse deflects and radially diffuses the flowing gas and primary air uniformly between the streams of air flowing through said plate for efficient combustion. A screen forwardly of said plate entrains the flame of combustibles slowing its forward movement. The gas manifold has an apertured partition seat between its inlet and outlet, and a pair of orifice plates with different openings are spring biased apart and removably positioned in the manifold, with one orifice plate seated in the partition, the orifice plates being reversible depending upon which size orifice plate is required for a selected fuel.

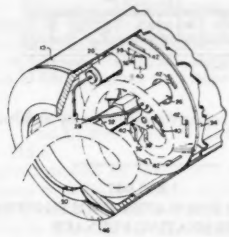
3,820,944

OIL BURNER

Norman E. Flournoy; David A. Morris, both of Richmond; Raymond Trippet, Highland Springs, and Julian H. Dancy, Richmond, all of Va., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 104,043, Jan. 5, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 303,882
Int. Cl. F23q *3/00*
U.S. Cl. 431—265 **6 Claims**

A gun type oil burner with a restriction plate in the barrel upstream of the nozzle and having annularly spaced orifices with swirl effecting flanges thereon to produce a rotational spin of air within the barrel. This is combined with narrow peripheral orifice slots in the plate, radially outwardly of the first named orifices. The latter project a sheath of air axially



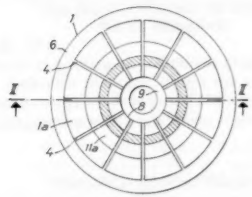
along the inner annular surface of the blast tube which surrounds the rotational swirl of air. Said swirling air mass is then constricted at the burner outlet, at which point atomized fuel is added to form a combustible mixture, which is immediately ignited.

3,820,945

AUTO-STABILISED GAS-BURNER

Roger Vignes, Paris, France, assignor to Gaz De France, Paris, France

Filed Nov. 22, 1972, Ser. No. 308,809
Claims priority, application France, Nov. 23, 1971, 71.41876
Int. Cl. F23d *13/36*
U.S. Cl. 431—349 **3 Claims**



The specification discloses an auto-stabilised gas burner which has a burner head defining a distribution chamber and comprising a series of vertical slots. At their upper part, the slots have a preferential flow zone produced by means of waisting formed by a shaped portion of the burner head and the lower face of a deflector.

3,820,946

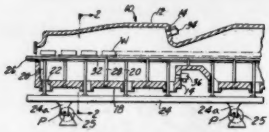
LONGITUDINALLY FIRED WALKING BEAM FURNACE

Ichiro Miyoshi, Osaka, and Tetsuya Tokitsu, Takarazuka, both of Japan, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed May 29, 1973, Ser. No. 364,692
Int. Cl. F27b *9/14*
U.S. Cl. 432—121 **3 Claims**

A walking beam furnace having conveying means and support means structured so that an open expanse is provided

beneath the work being treated. Direct fired burners are located so that they fire longitudinally into the open expanse



between the work support means thereby uniformly heating the work.

3,820,947

INSULATION FOR WATER-COOLED PIPES IN A REHEATING FURNACE

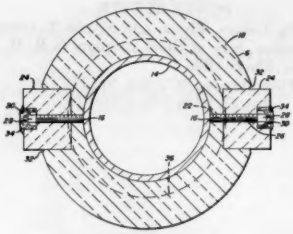
Louis Boto, and David B. Rodger, both of Baytown, Tex., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 20, 1972, Ser. No. 316,938

Int. Cl. F27b *13/06;* **F27d** *3/02*

U.S. Cl. 432—234 **6 Claims**

A fibrous ceramic insulating blanket is wrapped around the water-cooled pipes in a steel processing reheating furnace. The resilient blanket, in sections, is pressed onto threaded anchor studs projecting from the pipes and is held in place by ceramic anchors placed over each stud and secured to the stud by a lock nut. A ceramic mortar covers the lock nut seated in a



depression in the ceramic anchor. The assembly is then sprayed overall with a liquid rigidizer which upon hardening provides a relatively hard and erosion resistant outer layer over a resilient inner layer.

3,820,948

PROCESS OF DYEING HUMAN HAIR BASED ON PYRAZOLONE COMPOUNDS

Peter Berth, Leichlingen, Germany, assignor to Therachemie Chemisch Therapectische Gesellschaft m.b.H., Dusseldorf, Germany

Continuation-in-part of Ser. No. 721,941, April 17, 1968, abandoned. This application July 30, 1971, Ser. No. 167,855
Int. Cl. A61k *7/12*
U.S. Cl. 8—10.2 **6 Claims**

Process for the dyeing of human hair utilizing an aqueous solution containing from 0.1 to 5 percent by weight of dyes for application to hair, including living human hair, which contain as active components, a 3-substituted pyrazolone and an aromatic bi- or polyfunctional amine having at least one primary amino group and another functional group in para-position, or else a 4-aminopyrazolone. These dyes are applied in aqueous solution or preferably in the form of an aqueous cream or emulsion and may contain thickeners, grooming agents, perfumes. They may be in the form of a shampoo. Application to the hair is carried out at temperatures of 15° to 40° C, preferably at room temperature, and the time required is approximately 20 to 25 minutes. The dyes, in contrast to conventional ones, can be removed from the hair with reducing agents.

3,820,949

POLYOLEFIN BLENDS WITH OCCLUDED NITROGENOUS HETEROCYCLIC POLYAMIDES IN THE FIBERS DIFFERENTIALLY DISPERSED DYED

Robert F. Johnson, Lubbock, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 812,892, April 2, 1969, abandoned. This application Dec. 6, 1971, Ser. No. 205,401
Int. Cl. D06p *3/86*
U.S. Cl. 8—21 B **15 Claims**

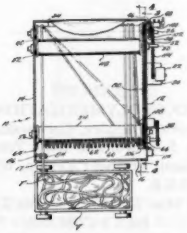
A method and article resulting from differentially dyeing a composite material by producing at least two fibers of the same spinnable polymeric composition possessing different concentrations of the same dye-reception promoter, forming said fibers into a composite material such as fabric or carpet and piece dyeing said composite material to produce different shades of the same color by contact with a suitable dye.

3,820,950

PROCESS AND APPARATUS FOR LIQUID TREATING OF TEXTILE FABRIC

Sammy G. Hiatt, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Dec. 15, 1964, Ser. No. 418,445
Int. Cl. B05c *11134*
U.S. Cl. 8—151.1 **66 Claims**



An apparatus and process for the liquid treatment of textile fabric, preferably in rope form, the textile fabric having its leading end attached to means which cause the same to travel in a confined endless path into and out of a treating liquid bath with the reamining portion of the textile fabric formed in successive spiral loops and moving into and out of the treating liquid, the trailing end of the textile fabric following loosely in an unconfined path into and out of the treating liquid.

3,820,951

PROCESS FOR THE THERMAL STABILIZATION OF POLYACRYLONITRILE FIBERS AND FILMS

Andrew H. Di Edwardo, Parsippany, and Klaus H. Gump, Gillette, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 28, 1972, Ser. No. 248,372
Int. Cl. D06c *7/04;* **C01b** *31/07*
U.S. Cl. 8—115.5 **16 Claims**

An improved process for the thermal stabilization of an acrylic fibrous material or film is provided. The fibrous precursor or film is impregnated with 0.5 to 10 per cent stannous chloride by contact with a solution of the same provided at a moderate temperature, dried to remove the solvent, and heated in a gaseous atmosphere containing 30 to 100 per cent by weight molecular oxygen at a more highly elevated temperature until a stabilized fibrous material or film is formed. The presence of the stannous chloride in combination with the gaseous atmosphere containing more than the usual concentration of molecular oxygen (e.g. 10 to about 20 per cent by weight) has been found to result in a substantially improved process. More specifically, the resulting stabilized acrylic fibrous materials and films exhibit enhanced physical properties (i.e. strength and modulus), and the stabilization reaction is accelerated in a controlled manner in the substantial absence of undesirable fiber coalescence. The resulting stabilized fibrous material or film is non-burning, and may be utilized as a fire resistant fiber, fabric, or film, or optionally carbonized or carbonized and graphitized to form a carbonaceous fibrous material or film.

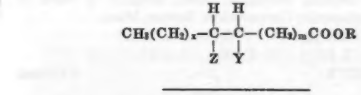
3,820,952

USE OF SOLID CARRIER FOR DYEING HYDROPHOBIC FIBERS

Kurt A. Dellian, Spring Valley; Marvin Weiskopf, Bronx, both of N.Y., and Samuel Lee, Fairlawn, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 3, 1972, Ser. No. 215,097
Int. Cl. D06p *5/04*
U.S. Cl. 8—173 **7 Claims**

A process of coloring a hydrophobic fiber with a disperse or cationic dyestuff is disclosed using a dye carrier composition containing a carrier which is a solid at a temperature of at least 45°C in conjunction with a compound of the formula:



3,820,953

METHOD FOR MEASURING LIQUID PARTICLE DISTRIBUTION FROM FOGS, CLOUDS, AND SPRAYS

William S. McEwan, China Lake, Calif., and Charles M. Drew, Redstone, Colo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1972, Ser. No. 298,707
Int. Cl. G01n *17/00;* **G01w** *1/14*
U.S. Cl. 23—230 R **3 Claims**

A method for studying the size, number and distribution of droplets in fogs, clouds or sprays of the type produced by aerosols used in weather modification and the like.

3,820,954

SEPARATOR FOR LIQUID-LIQUID EXTRACTORS

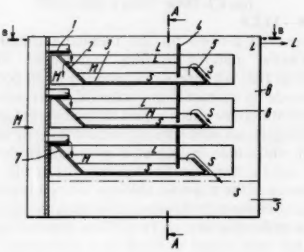
Hans-Martin Stonner, Frankfurt am Main, and Erhard Kraus, Muhlheim am Main, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 18, 1972, Ser. No. 272,915

Claims priority, application Germany, July 21, 1971, 2136397

Int. Cl. B01d *11/04, 17/02, 17/10*

U.S. Cl. 23—267 R 4 Claims



A phase separator for liquid-liquid extractors is disclosed and includes a mixer and a separator. A separator housing has an inlet for a mixture of phases and an outlet for separated pure phases. Internal fixtures are included which promote the separation of the phases and include horizontally extending flat boxes disposed one over the other and open at at least one major surface. Each of the boxes has at least one outlet at one edge of the closed major surface which opens to the surrounding space of the separator housing. These outlets are in the form of discharge weirs. Each box also has an inlet for the mixture of phases to be separated. The boxes are positioned in the separator housing one over the other so as to be coextensive at least in their longitudinal direction. The inlets for the boxes are walls which are outwardly inclined from the boxes and the discharge weirs are inwardly inclined to the boxes.

3,820,955

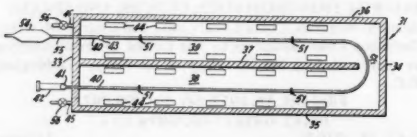
HORIZONTAL HIGH SEVERITY FURNACE

Herman N. Woebcke, Wayland, Mass., assignor to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Jan. 19, 1970, Ser. No. 3,621

Int. Cl. B01j *1/00;* C10b *1/06;* C07c *11/00*

U.S. Cl. 23—227 R 8 Claims



A furnace having horizontally disposed single pass tubes. The tubes of the furnace extend horizontally from the furnace inlet to the furnace outlet. Fluid passing through the horizontally disposed tubes is exposed to heat from the individual furnace burners only once.

3,820,956

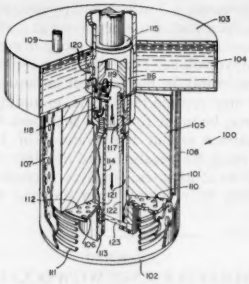
KIPP TYPE GAS GENERATOR WITH MOVABLE LIQUID REACTANT EXIT PORT

William Alexander Titterington, Lynnfield, and Robert White Milgate, Jr., Marblehead, both of Mass., assignors to General Electric Company, Wilmington, Mass.

Filed June 1, 1972, Ser. No. 258,511

Int. Cl. B01j *7/02*

U.S. Cl. 23—282 4 Claims



A chemical gas generator of the "Kipp" type is described in which the delivery port for the liquid reactant is continually repositioned as the solid chemical is consumed during gas generation. A solid chemical, such as sodium aluminum hydride, is mounted on a spring loaded perforated support plate. The liquid reactant is introduced through a delivery tube which has an exit port located below the perforated support plate. A thin walled, easily ruptured tube, preferably of plastic, surrounds the delivery tube.

A perforating element or knife is attached to the spring loaded pressure plate. As the solid chemical is consumed in generating gas, the spring loaded pressure plate moves upward. The perforating element, or knife moves upward along with the pressure plate perforating the plastic tube so that the liquid reactant delivery port is always positioned a fixed distance from the reaction site and the flow of reactant is not affected by the accumulation of the solid products of the reaction. Consumption of the chemical in the generator thus causes movement of the delivery port as a function of the consumption rate of the chemical thereby maintaining the port continuously above the accumulating layer of the solid products of reaction.

3,820,957

CONTINUOUS POLYMERIZATION REACTOR

Nikolai Alexandrovich Mihalev, Gorkovskoi oblasti, prospekt Dzerzhinskogo, 5, kv.46, and Boris Petrovich Shtarkman, Gorkovstoi oblasti, prospekt Lenina, 65, kv. 63, both of Dzerzhinsk, U.S.S.R.

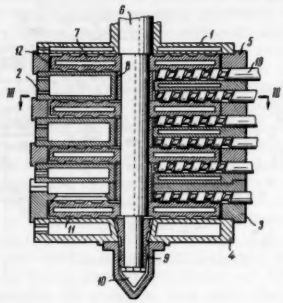
Filed Mar. 22, 1972, Ser. No. 236,831

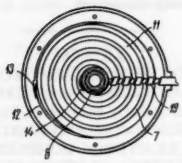
Int. Cl. C08f *1/98*

U.S. Cl. 23—285 11 Claims

A continuous polymerization reactor comprising plates discs arranged in a reactor body and mounted on a common drive shaft with stationary discs disposed therebetween. The stationary discs are provided with riffles wherein screws are arranged, interacting with helical grooves of a thread made on the flat sides of the plates. Said helical grooves communicate with one another in succession through clearance between the

stationary discs and distance sleeves fastened on the drive shaft between the stationary discs, and through clearances





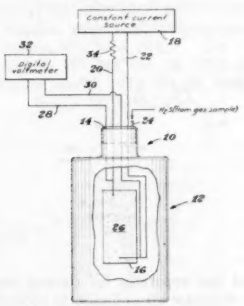
between the reactor body and the plates. The reactor is provided with a means for removing volatile components from the mass of material being processed.

3,820,958

HYDROGEN SULFIDE MONITOR

Chin Huan Cheng, and Bruce C. Peters, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 29, 1973, Ser. No. 327,394
Int. Cl. G01n 27/62; G01r 27/02
U.S. Cl. 23—232 E **3 Claims**



Apparatus and method for determining the presence of hydrogen sulfide in a gas mixture such as air even at or near room temperature at low parts per million or at higher levels. Silver is deposited on a thin dielectric film, then exposed to the hydrogen sulfide containing gas mixture. The electrical resistance across the film before and after exposure to hydrogen sulfide, plus the time exposed, are utilized in determining the amount of hydrogen sulfide present.

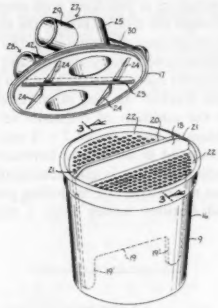
An apparatus utilizing standardized films provides direct reading hydrogen sulfide content results.

3,820,959

DISPOSABLE ANESTHESIA DEVICE

Lewis Abraham Wise, and John E. Grimm, both of Santa Monica, Calif., assignors to Will Ross, Inc., Milwaukee, Wis.

Division of Ser. No. 85,201, Oct. 29, 1970, Pat. No. 3,721,238
Filed Feb. 14, 1973, Ser. No. 332,316
Int. Cl. B01j
U.S. Cl. 23—284 **3 Claims**



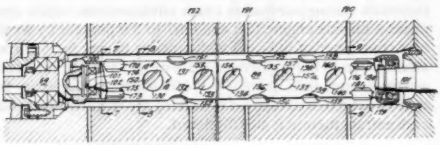
A disposable anesthesia device that is completely assembled and ready to use in administering anesthetic gas from a source thereof to a patient. The device provides a closed circuit connectable with a conventional anesthesia machine and consisting of a face mask, a rebreathing bag, a canister containing granular carbon dioxide absorbing material, flexible inhalation and exhalation tubes connecting the face mask with the canister and the rebreathing bag, and flap-like inhalation and exhalation valves, all parts of the device, with the exception of the granular canister contents, but including the valves, being molded or otherwise made of plastic and hence economically disposable after one use thereof to preclude the danger of patient cross contamination.

3,820,960

STIRRER FOR POLYMERIZATION REACTOR

Gerald M. Platz; William H. Palmer, both of Champaign, and James W. Mauck, Atwood, all of Ill., assignors to National Distillers and Chemist Corporation, New York, N.Y.

Division of Ser. No. 11,248, Feb. 13, 1970, Pat. No. 3,708,410.
This application Nov. 5, 1971, Ser. No. 196,099
Int. Cl. C08f 1/98
U.S. Cl. 23—285 **6 Claims**



A polymerization reactor having a hollow stirrer drum which is an elongated drum having apertures therethrough with paddles extending across the apertures. The stirrer drum is adapted to be concentrically disposed about an elongated source of gamma radiation which serves as the energy source for a polymerization reaction of material introduced into the reactor. The stirrer drum divides the reactor into two concentric and approximately equal volumes, one internal of the stirrer drum and one external of the stirrer drum, with the material being stirred and intermixed between the two chambers through the paddle apertures by rotation of the stirrer drum.

3,820,961

NICKEL BASE DIFFUSION BONDED ARTICLE

John W. Zelahy, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 186,490, Oct. 4, 1971, Pat. No. 3,759,692. This application Mar. 16, 1973, Ser. No. 341,882

Int. Cl. B23k *31/02*

U.S. Cl. 29—194 3 Claims

A nickel base, boron including bonding powder for use in bonding alloy members is provided with improved toughness and ductility through the elimination of the boride former and precipitation strengthener titanium and the boride formers and solution strengtheners molybdenum and tungsten, which for some applications have been included in age hardeneable bonding powders. Further melting point reduction can be obtained through the addition of elements selected from tantalum and hafnium in the sum of 2 – 4 weight percent. An unique joint produced in an article between alloy members using such bonding powder is characterizied by a recrystallized, non-planar microstructure including predominantly discrete, dispersed borides rather than a continuous planar boride phase.

3,820,962

COMPOSITION FOR REDUCING CO EMISSION

Edward B. Johnson, 4654 N. 34th St., Arlington, Va. 22201

Continuation-in-part of Ser. No. 165,745, July 23, 1971, abandoned. This application Dec. 7, 1972, Ser. No. 312,789

Int. Cl. C10l *1/02*

U.S. Cl. 44—56 7 Claims

A fuel additive composition which comprises a major amount of white oil and minor amounts of a dialkyl ether, for example diethyl ether, and oil of orange. The fuel additive is effective in substantially reducing the carbon monoxide emission from the combustion of a hydrocarbon fuel in an internal combustion engine while maintaining or even enhancing the fuel economy thereof.

3,820,963

MODIFIED TURBINE ENGINE FUEL

William R. Moore, Lake Jackson, Tex., and Robert E. Erickson, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 2, 1972, Ser. No. 231,374

Int. Cl. C10l *1/24*

U.S. Cl. 44—62 17 Claims

A modified turbine engine fuel having a decreased misting tendency and a resultant decreased fire hazard connected therewith during survivable crash environments which comprises a turbine engine fuel and 0.01 to 5.0 percent by weight of a copolymer of SO_2 and alpha olefins having 6–36 carbon atoms wherein the copolymer has a weight average molecular weight greater than about 1.0×10^6 and a polydispersity less than about 5.0. The method of making the modified fuel and a concentrate thereof is also disclosed.

3,820,964

REFUSE GASIFICATION PROCESS AND APPARATUS

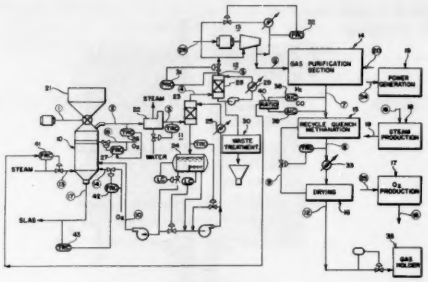
John C. Janka, Chicago, Ill., assignor to Consolidated Natural Gas Service Company, Cleveland, Ohio

Filed May 30, 1972, Ser. No. 257,633

Int. Cl. C10j *3/16*

U.S. Cl. 48—113 12 Claims

A refuse gasification process and apparatus for producing high-BTU pipeline gas which is interchangeable with natural gas. The gasification process is a relatively low pressure process, and utilizes a gasifier with a slagging bed rather than a fluidized bed as in many existing process. The raw refuse is gasified with steam and oxygen to produce a raw synthesis gas, and the H_2/CO ratio is controlled, by proper adjustment of the steam supply to the gasifier, in such a way as to yield a raw



synthesis gas from the gasifier having sufficient H_2 for methanation. In this fashion, recourse to a water-gas shift reaction is completely eliminated.

3,820,965

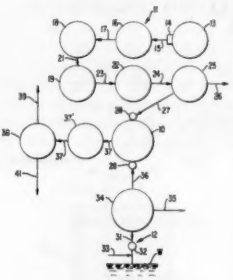
METHOD OF REDUCING ENVIRONMENTAL POLLUTION BY UTILIZING STACK GASES, RESULTING FROM THE BURNING OF FOSSIL FUELS, AND WATER, INCLUDING SEA WATER AND WASTE WATER, TO MANUFACTURE HYDROCARBON ENERGY FUEL, POTABLE WATER AND OTHER COMMERCIAL PRODUCTS

Robert V. New, 6356 Del Monte, Houston, Tex. 77027

Continuation-in-part of Ser. No. 207,050, Dec. 31, 1971, abandoned, which is a continuation-in-part of Ser. No. 191,322, Oct. 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 164,691, July 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 138,034, April 18, 1971, abandoned. This application Apr. 2, 1973, Ser. No. 347,048

Int. Cl. B01j *9/04*; E21b *43/23*

U.S. Cl. 48—197 R 24 Claims



A method and apparatus for treating smoke stack gases diverted to minimize air pollution to recover from the stack gases the individual constituents thereof, namely, carbon dioxide (CO_2), water (H_2O) and nitrogen (N_2) freed of other products, such as oxides; and to recover from water (including non-potable water such as sea water, waste water and even polluted water sources) the individual constituents thereof of interest here, namely, hydrogen (H_2); and delivering the recovered carbon dioxide and the recovered hydrogen into a catalytic reaction chamber under sufficiently high temperature conditions in the presence of a suitable catalyst to establish therein a reaction temperature to support a Sabatier catalytic reaction ($CO_2 + 4H_2 = CH_4 + 2H_2O$) hydrogenating

the carbon dioxide to form methane for use as fuel, and potable water for commercial usage. The apparatus suitable for practicing the method comprises a gas flow line including means for diverting a substantial portion of the plant stack gases through variant serially arranged processing means to cool the gases, remove deleterious compounds, and recover the useful components, namely, carbon dioxide, nitrogen and water; a water flow line for delivering appropriate quantities of sea, river, lake, and even polluted water through variant serially arranged processing means to either electrolytically or by direct fired heating and chemical reaction processing to convert the water into its constituents hydrogen and oxygen, or hydrogen and carbon monoxide, or hydrogen and metal oxide, and recovering the hydrogen; and means for combining the separated carbon dioxide and hydrogen in a catalytic reaction chamber at a suitable temperature in the presence of a suitable catalyst to sustain a Sabatier reaction ($CO_2 + 4H_2 = CH_4 + 2H_2O$), the suitable temperature preferably being provided either by use of ionizing transducers or direct fired heaters for heating the gases as they enter the reaction chamber, and separating the resulting methane (CH_4) and pure water for commercial use as fuel and potable water. The useful by-products, nitrogen, metal oxides, and oxygen produced when the water is dissociated, are diverted for economical usage.

3,820,966
DIAMOND GRINDING LAYER FOR HONING SEGMENTS

Josef Sejbal, and Frantisek Curn, both of Praha, Czechoslovakia, assignors to Naradi, Narodni Podnik, Praha, Czechoslovakia

Continuation-in-part of Ser. No. 139,937, May 3, 1971, abandoned. This application Sept. 8, 1971, Ser. No. 178,847

Claims priority, application Czechoslovakia, May 5, 1970, 3094-70

Int. Cl. C09c *1/68;* **B24d** *17/00*

U.S. Cl. 51—309 **1 Claim**

A diamond grinding layer, particularly suitable for honing segments comprising a porous metal carrier, a binding metal filling at least partially the pores of said carrier and diamond grinding grains, the metal carrier being composed of hard metal powder, a bonding metal powder and non metallic destruction particles, the metal carrier having wear properties substantially the same as the diamond grinding grains.

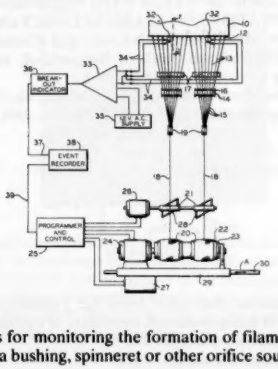
3,820,967
FILAMENT PRODUCTION MONITOR

Charles William Johnson, Waterville, Ohio, assignor to Johns-Manville Corporation, New York, N.Y.

Continuation of Ser. No. 102,768, Dec. 30, 1970, abandoned. This application Mar. 5, 1973, Ser. No. 338,005

Int. Cl. C03b *37/02*

U.S. Cl. 65—2 **3 Claims**



A means for monitoring the formation of filaments as they issue from a bushing, spinneret or other orifice source to sense disruption of filament formation as a change in the gas flow and/or thermal conditions in the vicinity of the filament formation means. Thermocouples will sense such changes to issue an actuating signal through suitable amplification means to process monitoring or control equipment.

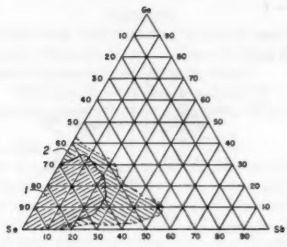
3,820,968
MAKING PATHS OF DEVITRIFIABLE CHALCOGENIDE GLASSES

Robert W. Haisty, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 28,840, April 15, 1970, abandoned. This application July 21, 1971, Ser. No. 164,940

Int. Cl. C03b *29/00;* **C03c** *17/00*

U.S. Cl. 65—33 **3 Claims**



This application discloses a novel glassy material composed of germanium, antimony and selenium. This glass has the unique characteristic that it can be converted from a non-crystalline amorphous glass to a crystalline electrically conductive material by the application of heat.

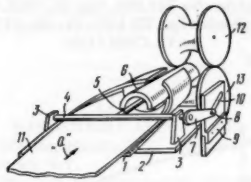
3,820,969
APPARATUS FOR MAKING PROFILED ARTICLES

German Nikolaevich Bogrets, Oktyabrskaya ploschad, 5, kv. 18; Oleg Alexeevich Semenov, ulitsa Kirona 8, kv. 30; Vyacheslav Fedorovich Dudkin, ulitsa Lenina 1, kv. 57, all of Dnepropetrovsk, and Anatoly Konstantinovich Vorontsov, Donetskoi oblasti prospekt Lomonosova, 166, kv. 2, Konstantinovka Donetskoi, all of U.S.S.R.

Filed July 29, 1971, Ser. No. 167,124

Int. Cl. C03b *5/32, 23/00*

U.S. Cl. 65—184 **4 Claims**



An apparatus for making profiled articles from an advancing strip of thermoplastic materials such as glass comprising a pair of spaced opposed forming elements which are supported on plates adapted for imparting reciprocatory movement to said forming elements both in a direction towards and away from one another and in a direction of advance of the strip. A rod is pivotably supported on the plates and is movable therewith, and a mandrel is secured to the rod to follow reciprocation of the plates in the direction of advance of the strip and to undergo pivotal movement with the rod. The mandrel is disposed between the forming elements and the advanc-

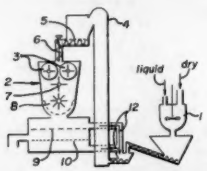
ing strip bent around the mandrel by the forming elements when the latter move towards one another. The rod is pivoted during reciprocatory movement thereof by engagement of a pin on a lever secured to the rod in an inclined guide slot in a fixed member. Such pivotal movement of the rod causes the mandrel first to press the thus bent strip against the forming elements and thereafter to retract therefrom and allow free passage of the thus formed strip.

3,820,970

LESS DUSTY GRANULAR GYPSUM PRODUCT AND PROCESS

Kenneth Ray Watkins, Maywood, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Dec. 27, 1972, Ser. No. 319,090
Int. Cl. C05d *9/02*
U.S. Cl. 71—1 **13 Claims**



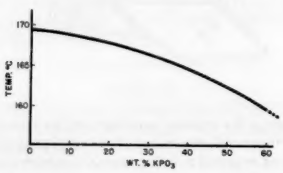
A compaction-granulation process of producing less dusty gypsum granules is disclosed. The process includes admixing calcium sulfate dihyrate with about 10–20 percent calcium sulfate hemihydrate and about 2–4 percent water to form a substantially dry solid-liquid mixture; compacting the mixture while at a pressure of about 1000–2000 psig into a sheet of compacted material; flaking the compacted material; and crushing the material to the desired granular size. The basic product may be used as a soil conditioner; and optional ingredients may be included to use the granular product as a fertilizer, plant nutrient supplement, pesticide, pharmaceutical and the like.

3,820,971

FERTILIZER COMPOSITION AND PROCESS

James F. Rounsaville, 1007 S. 9th St., Ponca City, Okla. 74601

Continuation of Ser. No. 755,084, Aug. 26, 1968, abandoned. This application Feb. 22, 1971, Ser. No. 117,767
Int. Cl. C05b *21/00*
U.S. Cl. 71—35 **5 Claims**



A novel melt fertilizer comprising potassium metaphosphate and ammonium nitrate, wherein a chloride-free KPO_3 can be derived from wet process phosphoric acid and potassium chloride; other nutrient salts can be incorporated in the melt.

3,820,972

SEPARATION OF LACTAMS FROM A MEDIUM COATING CONCENTRATED SULPHURIC TRIOXIDE IN COMBINATION WITH THE PREPARATION OF PHOSPHATE FERTILIZERS

Abraham H. De Rooij, Geleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands

Filed May 2, 1972, Ser. No. 249,728
Claims priority, application Netherlands, May 7, 1971, 7106342; May 7, 1971, 7106344
Int. Cl. C05b *11/08*
U.S. Cl. 71—37 **13 Claims**

A process for the recovery of lactams from a Beckmann rearrangement mixture of lactams and sulphuric acid or sulphur trioxide, with the production of a phosphate-containing fertilizer is disclosed. The Beckmann rearrangement mixture is partially neutralized by the addition of ammonium or alkali metal hydroxide, sulphate or carbonate in an amount such that the molar ratio between the sulphate formed and the sum of the sulphate formed and the free sulphuric acid is at least 1/8:1. Thereafter, the resulting partially neutralized solution is extracted by a substantially water-immiscible, organic lactam solvent to separate lactam from the remainder of said mixture, and the remainder of said mixture after such extraction is used for the decomposition of rock phosphate with formation of gypsum and of a free phosphoric acid-containing solution. This latter solution, after removal of gypsum and neutralization of the solution with ammonia or alkali liquor is converted into a dihydrogen phosphate-containing solution from which dihydrogen phosphate, suitable for use in fertilizers, is recovered after evaporative concentration.

The process provides for the ready separation of lactams from a Beckmann rearrangement reaction mixture, while at the same time producing, as a by-product, dihydrogen phosphate or a valuable dihydrogen phosphate containing fertilizer.

3,820,973

METHOD AND COMPOSITION FOR THE STIMULATION OF PLANT GROWTH

Robert L. Noveroske, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 12, 1973, Ser. No. 369,367
Int. Cl. A01n *9/22*
U.S. Cl. 71—77 **2 Claims**

Method for the stimulation of plant growth in the presence or absence of plant attacking fungal organisms which comprises treating plant seeds with a growth stimulating amount of a composition comprising 2-amino-6-chloro-4-(trichloromethyl) pyridine, as the active growth stimulant, in intimate admixture with an inert carrier therefor.

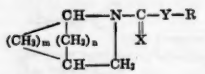
3,820,974

CONTROL OF WEEDS WITH N-CARBENYL DERIVATIVES OF AZABICYCLOOCTANES

Elmar Sturm, Arlesheim/Bosch-Land, and Christian Vogel, Binningen/Bosch-Land, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 61,442, Aug. 5, 1970, Pat. No. 3,705,165. This application Aug. 14, 1972, Ser. No. 280,610
Int. Cl. A01n *9/12*
U.S. Cl. 71—94 **14 Claims**

Compounds of the formula



wherein

R — represents lower alkyl, lower halogenalkyl, lower alkenyl, lower halogenalkenyl, cycloalkyl or cycloalkenyl,

m — represents the integer 2 or 3,

n — represents the integer 1 or 2

whereby the sum of $m+n=4$, and of the symbols X and Y one represents sulphur and the other represents oxygen or sulphur,

are disclosed as herbicidally active substances. Compositions as well as a method for controlling weeds and wild grasses with the aid of such compounds are also described.

3,820,975

METHOD FOR CONTROLLING PLANT GROWTH WITH SUBSTITUTED CYCLOHEXENONES

Albert J. Poje, Grandview, Mo., and Peter E. Newallis, Leawood, Kans., assignors to Chemagro Corporation, Kansas City, Mo.

Filed Nov. 12, 1970, Ser. No. 89,042
Int. Cl. A01n *9/12*
U.S. Cl. 71—98 **6 Claims**

Plant growth regulant compositions and methods of regulating the growth of plants using certain 3-substituted 5,5-dimethylcyclohex-2-ene-1-ones, some of which are known, which possess plant growth regulant, fungicidal, insecticidal, and acaricidal properties and which may be produced by conventional methods.

3,820,976

SLOW RELEASE SOIL FUMIGANTS

Wayne W. Wells; James R. Christie, and Julian H. Jackson, all of Jacksonville, Fla., assignors to Kerr-McGee Chemical Corp, Oklahoma City, Okla.

Filed Dec. 15, 1969, Ser. No. 885,342
Int. Cl. A01n *9/12*; **A01b** *79/00*; **A01c** *1/00*
U.S. Cl. 71—101 **5 Claims**

This invention relates to a slow release soil fumigant that may be utilized in soil without the need of placing a protective cover over soil treated with such fumigant. Broadly, the invention comprises a mixture of a fumigant, a protective colloid and a humectant in water. More particularly, the invention comprises a fumigant consisting essentially of an aqueous solution of about 23 to 36 parts sodium methyl dithiocarbamate, about 60 to 67 parts water, about 1 to 4 parts protective colloid and up to 6 parts humectant.

3,820,977

CARBONYL NICKEL POWDER

David Myers Llewelyn, Swansea, Wales, assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 159,258, July 2, 1971, Pat. No. 3,702,761. This application Aug. 21, 1972, Ser. No. 282,570
Claims priority, application Great Britain, July 7, 1970, 32959/70
Int. Cl. B22f *9/00*
U.S. Cl. 75—.5 AA **1 Claim**

Nickel carbonyl is thermally decomposed to nickel powder or pellets in the presence of nitric oxide, nitrogen trioxide or nitrogen peroxide in concentrations of 1 – 5000 ppm. or more. By suitable choice of gas concentrations and temperatures in the range 230 – 350°C the powder can be produced with substantially spherical particles or with low carbon content or both.

3,820,978

CHARGE ADDITIVE COMPOSITION TO CONTROL ELECTRICAL INDUCTION FURNACE LINING WEAR

Orville R. Magoteaux, Columbus, Ohio, assignor to Allied Mineral Products, Inc., Columbus, Ohio

Filed Feb. 26, 1973, Ser. No. 335,535
Int. Cl. C22d *7/00*
U.S. Cl. 75—95 **7 Claims**

A granular or powder refractory additive composition for use with electrical induction furnaces which is added to the initial charge or later during operation of the furnace so as to adhere to and/or react with the parent lining or slag to reduce or prevent wear. The additive composition comprises alumina as a base material with phosphate-bearing sodium oxide in the form of sodium hexametaphosphate which is especially useful with silica-base furnace linings.

3,820,979

PROCESS FOR THE PRODUCTION OF METALS

Joost Manassen, Rehovot, Israel, assignor to Yeda Research & Development Company Ltd., Rehovot, Israel

Filed Jan. 7, 1972, Ser. No. 216,274
Claims priority, application Israel, Jan. 12, 1971, 35991
Int. Cl. C22b *5/00*
U.S. Cl. 75—108 **8 Claims**

A process for the production of metallic metals selected from the group consisting of copper, silver and mercury, which comprises contacting an aqueous solution of the metal compound with a solution of a reduced quinonic compound, preferably an anthraquinone compound, in an organic solvent which is substantially insoluble in and immiscible with water, resulting in the precipitation of the metallic compound which is recovered. The organic phase may be separated, the quinonic compound may be reduced and used again for treating subsequent batches of metal salts.

3,820,980

AUSTENITIC STAINLESS STEEL

Albert G. Hartline, III, Tarentum, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed May 8, 1972, Ser. No. 251,637
Int. Cl. C22c *39/14*, *33/00*
U.S. Cl. 75—122 **8 Claims**

A substantially nonporous, austenitic stainless steel, and a method for producing it; consisting essentially of, in weight percent, from 10 to 30% chromium, from 15 to 45% manganese, from 0.85 to 3% nitrogen, up to 1% carbon, up to 2% silicon, balance essentially iron and residuals. Moreover, a steel wherein said elements are balanced in accordance with the following equations:

$$[30\,(\%C+\%N)+0.5\,(\%Mn)]/[\%Cr+1.5\,(\%Si)] \quad 1.5$$

$$\%Cr+0.8\,(\%Mn)-11.88\,(\%N-0.1)-28.25 \quad 0$$

3,820,981

HARDENABLE ALLOY STEEL

Robert F. Wilde, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

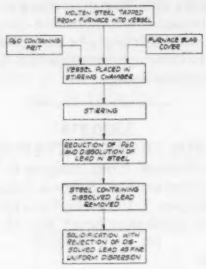
Filed Feb. 24, 1969, Ser. No. 801,798
Int. Cl. C22c *39/14*
U.S. Cl. 75—126 C **10 Claims**

Hardenable 14–16 percent chromium heat-resistant steel containing cobalt, silicon, molybdenum and tungsten in a special balanced composition for extended high temperature service life. May also contain manganese, nickel, vanadium, and boron. Heat treated by austenitizing, air hardening and tempering. Martensitic structure tempered above 1,100°F. is free of any detrimental delta ferrite, sigma phase, coalesced carbide network and retained austenite. Useful as precision cast articles of equipment for handling, forming or otherwise contacting hot plastic or molten glass in the manufacture of glassware.

3,820,982
METHOD OF ADDING LEAD TO STEEL WITH LEAD OXIDE SLAG

Jerry D. Thomas, Parma, and Cecil B. Griffith, North Royalton, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed June 19, 1972, Ser. No. 264,242
Int. Cl. C22c *33/00*
U.S. Cl. 75—129 **8 Claims**


MOLTEN STEEL TAPPED FROM FURNACE INTO VESSEL
PbO CONTAINING PATT
FURNACE SLAG COVER
VESSEL PLACED IN STIRRING CHAMBER
STIRRING
REDUCTION OF PbO AND DISSOLUTION OF LEAD IN STEEL
STEEL CONTAINING DISSOLVED LEAD REMOVED
SOLIDIFICATION WITH PRECIPITATION OF DISSOLVED LEAD AS FINE UNIFORM DISPERSION

High lead content of uniformly dispersed; finely divided, particles is obtained in cast steel through the dissolution of lead in the steel when molten. Lead is made available for dissolution by the reducing action of steel constituents upon lead oxide (PbO) that is contained in a covering slag.

3,820,983
NICKEL-SILICON MAGNESIUM ALLOY

Carrol Dean Starr, Whippany, and Teh P. Wang, North Caldwell, both of N.J., assignors to Wilbur B. Driver Co., Newark, N.J.

Filed Aug. 20, 1971, Ser. No. 173,671
Int. Cl. C22c *19/00*
U.S. Cl. 75—170 **2 Claims**

A nickel-base alloy, useful as a negative thermoelement, is disclosed. The alloy consists essentially of from about 3.25 to about 5 percent by weight of silicon and from about 0.03 to about 0.25 percent by weight of magnesium and the balance nickel. The new alloy is more oxidation resistant and has a greater EMF stability than existing type K negative thermoelements.

3,820,984
METHOD OF MIGRATION IMAGING USING FUSIBLE PARTICLES

Robert W. Gundlach, Victor, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 851,872, Aug. 21, 1969, Pat. No. 3,648,607. This application July 29, 1972, Ser. No. 167,522
Int. Cl. G03g *13/20, 13/22*
U.S. Cl. 96—1 PS **4 Claims**

A migration imaging system having a migration imaging member with a binder layer of softenable material wherein a mixture of electrically photosensitive and inert fusible particles is dispersed and an imaging process wherein the fusible particles are fused thereby fixing the migrated image of the two types of particles. The imaged member is used as a lithographic printing master.

3,820,985
METHOD AND APPARATUS FOR INDUCTIVE ELECTROPHOTOGRAPHY

Joseph Gaynor, Arcadia; Terry G. Anderson, Pasadena; Walter Hines, Sierra Madre, and Len A. Tyler, Pasadena, all of Calif., assignors to Bell & Howell Company, Pasadena, Calif.

Filed Jan. 6, 1972, Ser. No. 215,873
Int. Cl. G03c *13/16*
U.S. Cl. 96—1 R **15 Claims**

A thin insulative film is applied to be in direct contact with a surface carrying an electrostatic image which has a potential sufficient for adherence by induction of toner to the insulative film but insufficient to discharge when in contact with or upon separation of the toned insulative film. When the surface is photoconductive, it is exposed before or after contact with the insulative film to a pattern of discharging radiation to form an electrostatic image thereon. As one form of image development, toner is applied to the insulative film while in direct contact with the imaged surface. Thereafter, the toner image may be transferred to a support member. Toning and toner transfer is repeated without further charge and without further exposure.

3,820,986
LIQUID DEVELOPMENT METHOD AND MATERIALS

Osamu Fukushima; Masamichi Sato, and Yasuo Tamai, all of Asaka, Japan, assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 94,967, Dec. 3, 1970, abandoned. This application Oct. 19, 1972, Ser. No. 298,884
Claims priority, application Japan, Feb. 20, 1970, 45-14935
Int. Cl. G03g *13/10*
U.S. Cl. 96—1 LY **7 Claims**

Developed images with substantially no fogging in the background areas or streaking in the image areas are obtained in a liquid development system employing a liquid developer comprising an insulating liquid vehicle having dispersed therein charged toner particles and charged extender body pigment particles selected from the group consisting of calcium carbonate, aluminum hydroxide, barium sulfate, aluminum oxide, talc, silica, calcium silicate, magnesium carbonate, magnesium oxide and mixtures thereof.

3,820,987
PHOTOELECTROPHORETIC IMAGING WITH FIXING ON A SEPARATE ELECTRODE

John B. Wells, Rochester, and Addison C. Sheckler, Cato, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 6, 1972, Ser. No. 312,532
Int. Cl. G03g *13/22, 13/20*
U.S. Cl. 96—1.3 **8 Claims**

A photoelectrophoretic imaging system wherein electrically photosenstive pigment particles are dispersed in an insulating liquid exposed to a light image while subjected to an electrical field causing particle migration in image configuration. The particle pigment image is fixed by utilizing resinous particles which can be preferentially migrated to the image-bearing surface. Application of solvent or heat fixes the images.

3,820,988
METHOD OF SENSITIZING ZINC TELLURIDE

Yen T. Tan; Rajinder P. Khosla; John R. Fischer, and Deepak K. Ranadive, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 13, 1972, Ser. No. 234,382
Int. Cl. G03g *5/02, 5/04*
U.S. Cl. 96—1.5 **5 Claims**

Zinc telluride can be sensitized by annealing in the presence of vapors of both zinc metal and a Group IIIA metal dopant. The sensitized zinc telluride exhibits photoconductivity.

3,820,989

TRI-SUBSTITUTED METHANES AS ORGANIC PHOTOCONDUCTORS

Norman Geoffrey Rule, and Richard C. Riordan, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 30, 1969, Ser. No. 862,466
Int. Cl. G03g 5/06
U.S. Cl. 96—1.5 16 Claims

Alkylbis(N,N-dialkylaminoaryl)methane, cycloalkylbis(N,N-dialkylaminoaryl)methane and cycloalkenylbis(N,N-dialkyl-aminoaryl)methane are useful as photoconductors in electrophotographic elements.

3,820,990

DYE DIFFUSION TRANSFER ELEMENTS AND PROCESS

Delbert D. Fix, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 25, 1972, Ser. No. 292,008
Int. Cl. G03c 7/00, 5/54, 1/48, 1/40
U.S. Cl. 96—3 19 Claims

Film units for use in color diffusion transfer systems exhibit reduced stain when provided with a layer comprising a polymeric anhydride having therein a low molecular weight ester of maleic or fumaric acid.

3,820,991

PROCESS FOR PRODUCING PHOTOGRAPHIC SILVER IMAGES

Marcel Karel Van Doorselaer, S-Gravenwezel; Valere Frans Danckaert, Boechout, and Gaston Jacob Benoy, Edegem, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 21, 1971, Ser. No. 210,566
Claims priority, application Great Britain, Jan. 5, 1971, 479/71
Int. Cl. G03c 5/50, 7/34, 1/92
U.S. Cl. 96—22 24 Claims

A method is described of producing photographic colour images which comprises radiation-wise exposing a photographic silver halide element and rapidly colour developing the exposed element at a temperature of at least 30°C, by means of an aromatic primary amino colour developing agent in the presence of a colour forming coupling compound, wherein the said element comprises at least one layer of a silver halide emulsion obtined by mixing, prior to coating, with the silver halide emulsion capable of producing a visible image by the said radiation-wise exposure and subsequent development, a relatively low-speed silver chloride-containing emulsion, the speed of which is insufficient to produce a visible image by the said exposure and development. By the addition of the non-image forming silver chloride-containing emulsion to the image-forming silver halide emulsion colour images with satisfactory contrast are obtained upon processing at elevated temperature which is of particular importance for the production of radiographic colour images.

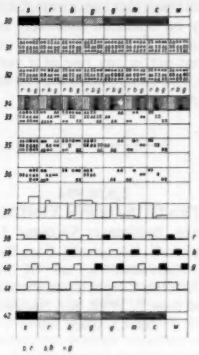
3,820,992

METHOD AND APPARATUS FOR RECORDING COLOR PICTURE INFORMATION ON PHOTOGRAPHIC MATERIAL

Friedrich Bestenreiner, Grunwald; Josef Helmberger, Munich; Rudolf Meyer, Leverkusen, all of Germany, and Louis Achilles Meeussen, Mortsel/Antwerpen, Belgium, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 4, 1972, Ser. No. 294,890
Claims priority, application Germany, Oct. 6, 1971, 2149843
Int. Cl. G03c 5/04; H04n 1/46
U.S. Cl. 96—27 E 6 Claims

A method of recording color picture information from an original scene on a film having a single layer of photosensitive emulsion containing a mixture of silver halide grains of different spectral sensibilities. The film is exposed in an optical camera to record a first series of monochrome images of the luminance content in the original color picture scene and a second series of monochrome images which are to represent the color content of the scene. The film is thereupon treated in



a laboratory, and such treatment involves a reversal process including the exposure of a color raster onto the film portion which is provided with the second series of images. The spatial frequency of the color raster corresponds to the desired scanning frequency for the purpose of reproducing the images by color television scanning techniques.

3,820,993

LIGHT SENSITIVE REPRODUCTION AND ELECTRON BEAM SENSITIVE MATERIAL

James M. Lewis, Aurora, and Eugene Wainer, Shaker Heights, both of Ohio, assignors to Horizons Incorporated, a Division of Horizons Research Incorporated, Cleveland, Ohio

Division of Ser. No. 141,393, May 7, 1971, Pat. No. 3,769,023.
This application June 19, 1973, Ser. No. 371,431
Int. Cl. G03c 5/00
U.S. Cl. 96—35.1 7 Claims

Light sensitive reproduction and electron beam sensitive material useful in preparing positive and/or negative copies, planographic and deep etched lithographic plates, deep etched printing plates, thin and thick film printed circuits, circuits for microelectronics, and chemical milling of metals, plastics and glass, is formed by coating a suitable support with a composition which includes (1) a hydroxy alkyl cellulose; (2) an ethenically unsaturated vinyl monomer including N-vinyl monomers; (3) at least one compound which produces free-radicals on exposure to light; (4) color formers taken from the general class of intermediates which produce color on exposure to condensation agents, oxidizing agents, and/or acids; (5) organic sulphur compounds for the promotion of adhesion; and (6) agents for improving the shelf stability of the product either in dissolved form or in the form of a solvent-free layer on a suitable surface taken from the class of cresols, phenols and triaryl compounds of the A sub group of metals taken from the 5th column of the Periodic Table. The composition may or may not contain other compounds which promote polymerization and/or crosslinking on exposure to light. The composition is dry working and is placed into solution for coating purposes only in organic solvents. After exposure and suitable development, the non-image areas may be removed by washing in water which has no effect on the areas which are exposed to light or electron beams. The exposed areas are colored and are hydrophobic in nature, readily accepting ink so as to make the end result suitable for lithographic and printing purposes. The composition has the

further feature that while the non-image areas are soluble in cold water the image areas after exposure, development and washing in cold water may be removed readily for circuit purposes by washing in hot deionized water or in certain cases by a mixture of water and acetone. The composition is characterized by exceptionally high resolution, and though originally sensitive primarily to the ultraviolet and to electron beams can be sensitized to the visible through the panchromatic range by the addition of suitable color sensitizers. Certain aspects of the composition may be operated positively or negatively. The composition is further characterized that under suitable conditions it will print-out in any one of a variety of prechosen colors, if desired. The composition may be utilized for imaging and/or resist purposes as desired.

3,820,994

PENETRATION OF POLYIMIDE FILMS

Frank A. Lindberg, Baltimore; Seymour J. Ponemone, Randallstown; Stephen G. Konsowski, Glen Burnie, and Maurice B. Shamash, Randallstown, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 7, 1972, Ser. No. 260,636

Int. Cl. G03c *5/00*

U.S. Cl. 96—36 **22 Claims**

There is disclosed a method of producing holes in polyimide films, typically KAPTON polyimide films, of substantial thickness, typically about .005 inches. Such films are typically used for multilayer solid-state circuits. An aluminum coating is deposited by vapor deposition on both surfaces of the film, typically to a thickness of about .0004 inches. A photoresist is deposited on the coating on each surface of the film and is imaged to define the holes in such manner that the areas of each hole in both sides of the film are coextensive. The film is developed exposing the aluminum over the areas of the holes. The aluminum at the hole areas is then etched or dissolved by an acid solvent. Thereafter the polyimide where the aluminum has been etched away and the unexposed photoresist are etched with hydrazine. Finally, the aluminum which is now exposed is removed by an acid solvent.

3,820,995

PHOTOCHROMIC MATERIAL CONTAINING A SPIROPYRAN COMPOUND, A POLYHALOGENATED HYDROCARBON PHOTOACTIVATOR AND AN ACETANILIDE SENSITIZER AND THE USE THEREOF IN PHOTOIMAGING

Ludovicus Lucas Mertens, Borgerhout; Jozef Willy Van Den Houte, Berchem, and Freddy Ghisleen Van Royen, Wommelgem, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Aug. 25, 1972, Ser. No. 283,756

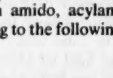
Claims priority, application Great Britain, Aug. 27, 1971, 40349/71

Int. Cl. G03c *5/24, 1/52*

U.S. Cl. 96—48 R **20 Claims**

A photographic process wherein a visible image is formed in a recording material which comprises in intimate admixture:

1. at least one spiropyran compound,
2. at least one ultra-violet radiation-sensitive compound capable of producing on exposure with ultra-violet radiation with the spiropyran compound a dye salt, and in working relationship with said mixture an organic compound, which is an amido, acylamino or ureido compound corresponding to the following general formula:



wherein:

R_1 represents an organic group of the type present in a carboxylic acid chloride, a $—NHR_3$ or a

group in which each of R_3 and R_4 represent an alkyl group or an aryl group, and

R_2 represents hydrogen, or an organic group.

3,820,996

PROCESS FOR DEVELOPMENT OF TWO-COMPONENT DIAZOTYPE PHOTOSENSITIVE MATERIALS

Kouzi Nihyakumen; Taizo Yokoyama; Yasutoki Kamezawa, and Tatsuo Aizawa, all of Osaka, Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Filed July 25, 1972, Ser. No. 275,071

Claims priority, application Japan, July 31, 1971, 46-57159

Int. Cl. G03c *5/34*

U.S. Cl. 96—49 **6 Claims**

A process for development of two-component diazotype photosensitive materials comprising exposing image-wise to light a photosensitive material having a two-component diazotype photosensitive layer comprising a photosensitive diazonium salt, a coupler capable of coupling with said diazonium salt and an acidic stabilizer, applying a small amount of an activating liquor to the photosensitive layer of the exposed photosensitive material and thereafter heating the activating liquor-applied photosensitive material according to need, said activating liquor being a solution or dispersion of a carboxylic acid salt selected from the group consisting of alkali metal carboxylates, alkaline earth metal carboxylates and mixtures thereof.

3,820,997

METHOD OF COLOR DEVELOPMENT PROCESSING FOR FORMING STABLE PHOTOGRAPHIC IMAGES

Kazuo Shirasu; Tadao Hatano; Isao Shimamura; Mitsuo Ozawa, and Haruhiko Iwano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 12, 1972, Ser. No. 297,163

Claims priority, application Japan, Oct. 15, 1971, 46-81379

Int. Cl. G03c *7/00, 5/32, 5/38*

U.S. Cl. 96—56 **19 Claims**

In a color development process for forming stable photographic images by color-developing and bleach-fixing a silver halide color photographic material containing one or more couplers, the improvement which further comprises processing the material with an oxidizing solution containing 0.3 – 3 g/liter of a ferricyanide complex salt.

Preferably this processing is followed by processing in a solution containing a reducing compound. The solutions used are also set out in detail.

3,820,998

DIRECT-POSITIVE PHOTOGRAPHIC ELEMENTS AND PROCESSES FOR PREPARING DIRECT-POSITIVE SILVER HALIDE EMULSIONS

Jean-France L. P. Barbier, and Guy Renard, both of Vincennes, France, assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 874,393, Nov. 5, 1969, Pat. No. 3,679,424. This application Feb. 3, 1972, Ser. No. 223,372

Int. Cl. G03c *5/24*

U.S. Cl. 96—64 **7 Claims**

This invention relates to direct-positive, silver halide, photographic elements. In one aspect, at least one layer of said element contains nitron. In another aspect, an overlayer containing light-insensitive silver chloride is used to provide more

uniform photographic characteristics in used developers. In still another aspect, improved direct-positive silver halide grains are prepared by reducing a portion of the water-soluble silver salt before admixture with the water-soluble halide to precipitate the silver halide grains.

3,820,999

IMAGE-RECEIVING ELEMENT FOR USE IN PHOTOGRAPHIC SILVER HALIDE DIFFUSION TRANSFER PROCESS

Nobuo Tsuji; Takushi Miyazako; Kinji Ohkubo, and Kazunobu Kato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 27, 1971, Ser. No. 193,183
Claims priority, application Japan, Oct. 27, 1970, 45-94880
Int. Cl. G03c *1/48*
U.S. Cl. 96—76 R **11 Claims**

An image-receiving element for use in silver halide diffusion transfer processes, which element comprises a support having coated thereon a diffusion transfer image-receiving layer comprising a colloidal silicon dioxide containing silver-precipitating nuclei dispersed therein, said image receiving layer being overcoated with a layer containing therein poly-addition products derived from a bisacrylamide and a diamine compound, which bisacrylamide is represented by the following general formula

$$CH_2{=}CHCONH{-}R{-}NHCOCH{=}CH_2$$

wherein R is a divalent hydrocarbon group having not more than 10 carbon atoms. The overcoating layer serves as a stripping layer of improved properties.

3,821,000

SILVER IMAGE STABILIZATION WITH NOBLE METAL COMPOUNDS AND ENEDIOL DEVELOPERS

Edwin H. Land, Cambridge; Stanley M. Bloom, Waban, and Leonard C. Farney, Melrose, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 145,044, May 19, 1971, Pat. No. 3,730,716. This application Nov. 7, 1972, Ser. No. 304,489
Int. Cl. G03c *1/48*
U.S. Cl. 96—76 R **26 Claims**

The present invention relates to a novel photographic film unit adapted to provide silver images of enhanced image stability which comprises photosensitive silver halide, a noble metal compound containing a noble metal ion below silver in the Electromotive Force Series of Elements, and a silver halide developing agent whose oxidation product is substantially nonoxidative to the thus-formed silver image for a time sufficient to enable the noble metal ion to contact said silver image to provide sustained and long-lasting stabilization effects.

3,821,001

HEAT DECOLORIZABLE ANTIHALATION LAYERS OF A VANADIUM COMPLEX OF 8-HYDROXYQUINOLINE

Joanne B. Weber, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 1, 1972, Ser. No. 248,917
Int. Cl. G03c *1/34*
U.S. Cl. 96—84 R **14 Claims**

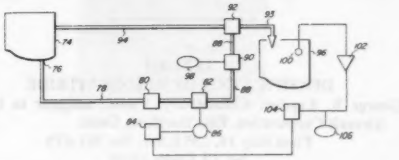
A photosensitive element comprises a support, a light-sensitive coating, an alkali bleachable vanadium complex of 8-hydroxyquinoline and a heat labile alkali precursor. An antihalation layer comprising a vanadium complex of 8-hydroxyquinoline is bleached by heating the element to about 80°C to about 250°C in the presence of a heat labile alkali precursor.

3,821,002

PROCESS CONTROL APPARATUS AND METHOD FOR SILVER HALIDE EMULSION MAKING

Gerald John Culhane, Spencerport; Gary Richard Layton, Pittsford, and Walter Elwood Pittman, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 6, 1972, Ser. No. 231,842
Int. Cl. G01n *27/00;* **G03c** *1/02*
U.S. Cl. 96—94 R **7 Claims**



The disclosure relates to a control apparatus and method for the preparation of silver halide emulsions in which the flow rates of the reactants can be controlled to provide a desired pAg in the precipitation vessel. Several embodiments are used, depending upon the desired accuracy of pAg. The pAg and flow rate can also be caused to follow programs to maintain constant, or to vary, the pAg during a particular emulsion making process.

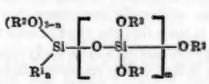
3,821,003

BINDERS FOR FINISHING AND COATING COMPOSITIONS

Werner Dittrich, Herten/Baden, and Arnold Lenz, Kohn-Stammheim, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Mar. 31, 1971, Ser. No. 129,987
Claims priority, application Germany, Apr. 18, 1970, 2018622
Int. Cl. C07f *7/18;* **C09d** *5/08;* **C09k** *3/00*
U.S. Cl. 106—1 **11 Claims**

Finishing and/or coating compositions, particularly for use with metallic pigments and for covering metallic surfaces, which use as the binder for the pigment partially hydrolyzed alkoxy silanes of the general formula:



wherein R^1 is alkyl, aryl, alkenyl or aralkyl; R^2 are alkyl groups of one to 10 carbon atoms; m is 0 to 10; and n is 1, 2 or 3. The coatings of this invention give superior cathodic protection, have improved thermal stability and have improved crack resistance as compared to otherwise similarly pigmented coatings which utilize different binders.

3,821,004

NiO AND CoO CONTAINING GLASS FOR TELEVISION DISPLAY CATHODE-RAY TUBES

Coenraad Maria LaGrouw, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 837,794, June 30, 1969, abandoned. This application Nov. 10, 1971, Ser. No. 197,511
Claims priority, application Netherlands, July 3, 1968, 6809435
Int. Cl. C03c *3/04, 3/24*
U.S. Cl. 106—52 **2 Claims**

A glass suitable for the window of a cathode-ray television display tube having a relatively increased transmission for red

light (at approximately 618 mn) and a relatively decreased transmission for blue light (at approximately 455 nm). The glass, which is otherwise standard, includes NiO and CoO in a weight ration between 10 and 30 and satisfies the condition that

$$0.4<97C_{CoO}+21C_{NiO}<0.5$$

C_{CoO} and C_{NiO} representing the CoO and NiO contents respectively.

3,821,005

DENSIFICATION OF SILICON NITRIDE

George K. Layden, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed May 18, 1973, Ser. No. 361,678
Int. Cl. C04b 35/58
U.S. Cl. 106—55 3 Claims

Novel sintering aids are added to silicon nitride powders to permit hot pressing to high density with superior strength retention at high temperatures.

3,821,006

PATCHING METHOD

Carl H. Schwartz, Toledo, Ohio, assignor to Dentsply International Inc., York, Pa.

Filed Apr. 16, 1971, Ser. No. 134,882
Int. Cl. C04b 9/04
U.S. Cl. 106—85 6 Claims

A method of repair using a two component system of a reactive component and an inert particulate aggregate. The reactive component is a mixture of an acid phosphate salt and MgO particles and the aggregate can be sand and silica. The MgO particles are minus 100 mesh and have a bulk density of at least 50 pounds per cubic foot. From 7-50 parts by weight of the reactive component are mixed with from 93-50 parts by weight of the aggregate. The proportion of the acid phosphate salt to MgO is maintained such that a continuous cementitious phase is formed during reaction to form magnesium phosphate and surrounds the aggregate and the remaining MgO particles. A workable slurry is formed by mixing the reactive component and the aggregate with sufficient water that the exothermic heat of reaction is such that the slurry cures to a solid having adequate compressive strength at an early cure age. The slurry is inserted in the defect which requires patching, is shaped as required, and is allowed to harden.

3,821,007

SPRAY-TYPE PAN RELEASE AND METHOD OF MAKING THE SAME

Wayne C. Carey, Rittman, Ohio, assignor to Wendel W. Carey and Mrs. Kay Freeland, both of Rittman, Ohio, part interest to each

Filed Mar. 15, 1973, Ser. No. 341,400
Int. Cl. C08b 25/02, 21/44; C08h 9/00
U.S. Cl. 106—150 4 Claims

A spray type pan release material and a method for making the same including heating a vegetable shortening to melt the same, mixing the melted liquid shortening with commercial grades wheat and soybean flour, and thereafter mixing a liquid vegetable salad oil and lecithin with the flour-shortening mixture to obtain a homogeneous paste mixture that can be dispensed from an aerosol container to form a superior release coating on a desired article.

3,821,008

SUSPENDING AGENT FOR REFRACTORY PAINTS

Wesley A. Jordan, and Walter H. Carter, both of Minneapolis, Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 236,287, March 20, 1972, abandoned. This application Feb. 23, 1973, Ser. No. 335,392
Int. Cl. C08b 25/00, 27/02
U.S. Cl. 106—209 4 Claims

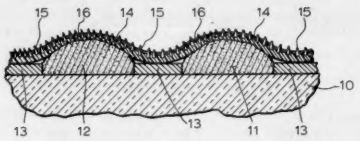
Refractory paint thickened with a blend of xanthomonas and locust bean gums.

3,821,009

METHOD OF ALUMINIZING A CATHODE-RAY TUBE SCREEN

Martin L. Lerner, River Forest, and Roy Maskell, Oak Park, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 28, 1972, Ser. No. 248,708
Int. Cl. C03c 17/12; H01j 31/20
U.S. Cl. 117—33.5 CM 13 Claims



A cathode-ray tube image screen panel having phosphor materials thereon is covered by a thin aluminum layer to provide a mirror effect for reflecting the light emitted by the phosphor forward to increase the brightness of the cathode-ray tube. The inventive method prevents blistering of the aluminum layer during bakeout. An organic decomposable base layer is first applied over the phosphor material. A solution comprising a volatilizable crystalline solute dissolved in a suitable solvent is provided and is coated over the base layer and allowed to dry so that the solute crystalizes. Thereafter an aluminum layer is formed over the crystalized solute which pierces the aluminum to allow escape of gases generated when the organic base layer decomposes and the crystalline solute vaporizes during bakeout.

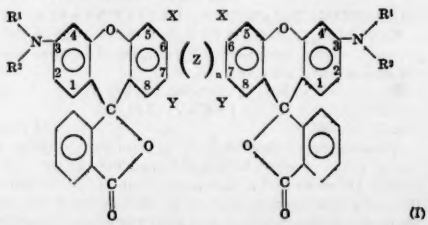
3,821,010

BISFLUORAN CHROMOGENIC COMPOUNDS, PREPARATION THEREOF, AND PRESSURE- SENSITIVE COPY SYSTEMS EMPLOYING SAME

David N. Vincent, Glenview, and Cheng Hsiung Chang, Chicago, both of Ill., assignors to Champion International Corporation, New York, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,294
Int. Cl. B41c 1/06
U.S. Cl. 117—36.2 9 Claims

A substantially colorless bisfluoran chromogenic material having the structural formula



(I)

wherein

R^1 and R^2 each represent an alkyl group;

X and Y each represent a hydrogen atom, a halogen atom, an hydroxyl group, an alkyl group, a nitro group, an amino group, an acyl group, or a carboalkoxy group;

Z represents an oxy radical, a carbonyl group, an alkylene group, an alkylidene group, a sulfonyl group, or a thio radical; and

n represents an integer from 0 to 1.

The bisfluoran compounds are produced by reacting a 4-dialkylamino-2-hydroxy-2′-carboxybenzophenone with a diphenol wherein the diphenol is unsubstituted in at least one of the positions ortho to an hydroxyl group in each of the phenyl rings. The bisfluorans are used in pressure-sensitive copy systems comprising a support bearing microcapsules containing the bisfluorans, alone, or in combination with other color-forming materials.

3,821,011

RECORDING METHOD

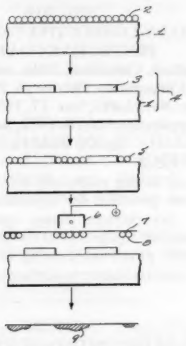
Masakazu Hashiue; Hiroyuki Ueda; Satoru Honjo, and Shingo Ooue, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 22, 1970, Ser. No. 83,007

Claims priority, application Japan, Oct. 22, 1969, 44-84543

Int. Cl. G03g *13/10*

U.S. Cl. 117—37 LE **8 Claims**



A recording method comprising forming a metallic image on a dielectric film base, then generating electric charge on the film base by friction electrification, and simultaneously applying toner material having the inverse polarity to that of the electric charge on the electrified film base.

3,821,012

MICROPOROUS WATER-VAPOR PERMEABLE SHEET MATERIAL CARRYING CLOSELY SPACED RAISED POLYMER DEPOSITS

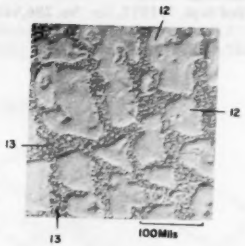
Charles Joseph Lattarulo, Wayne, N.J., and Frank Peter Civardi, White Plains, N.Y., assignors to Inmont Corporation, New York, N.Y.

Continuation of Ser. No. 833,518, June 16, 1969, abandoned. This application Sept. 3, 1971, Ser. No. 176,393

Int. Cl. B44d *1/16*

U.S. Cl. 117—45 **10 Claims**

Flexible water vapor permeable sheet material having a microporous surface of elastomeric polyurethane by applying a discontinuous or open low relief pattern of small closely spaced raised deposits having heights in the range of about 0.1 to 1 mil covering about 30 to 70 percent of the total projected area of the surface. The product is a leather substitute highly



resistant to abrasion and scuffing and having high moisture vapor permeability. Preferably a grain pattern in higher relief is applied over the low relief pattern.

3,821,013

SURFACE MODIFICATION OF GRAPHITE FIBERS

Lawrence R. Daley, and George R. Ferment, both of Dover, N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 7, 1972, Ser. No. 223,975

Int. Cl. B44d *5/12*

U.S. Cl. 117—46 CC **14 Claims**

Graphite fibers exhibiting an enhanced ability to bond to a matrix material (e.g., a thermosetting resinous material or a metallic material) are produced wherein a film of amorphous carbon in intimate association with titanium is provided upon the surface of the same. A predominantly graphitic carbonaceous fibrous material is coated with a film of a dihydropyridacene polymer in intimate association with a hydrolyzable organotitanium compound, the organotitanium compound hydrolyzed to form titanium dioxide, and the polymer portion of the film carbonized to a predominantly amorphous form. Composite articles which incorporate the carbon fibers produced by the present process exhibit improved physical properties, such as an improved interlaminar shear strength.

3,821,014

PHOSPHATE COATED POLYMERIC SHAPED OBJECTS

Vernon C. Haskell, and James L. Hecht, both of Richmond, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 182,641, Sept. 22, 1971, abandoned. This application July 19, 1972, Ser. No. 273,301

Int. Cl. C01b *25/36*; B32b *27/06*

U.S. Cl. 117—46 FC **9 Claims**

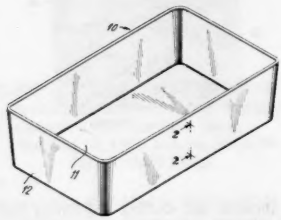
Organic polymeric shaped objects, such as films, coated with a substantially continuous, gas-impermeable coating of aluminum and/or ferric orthophosphate of a specific atom ratio, and a process for their preparation using colloids or solutions of the coating material.

3,821,015

HEAT-RESISTANT, VAPOR BARRIER RELEASE COATING

Robert S. Feinberg, Teaneck, N.J., assignor to Chyplex Industries, Inc., Flushing, N.Y.

Filed Sept. 7, 1972, Ser. No. 286,966
Int. Cl. B44d *1/092*
U.S. Cl. 117—47 A 5 Claims



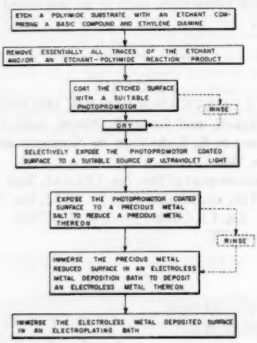
A food-heating utensil is formed of a heat responsive gas or vapor releasing material such as paper or a thermoset cross-linked polyester substrate coated or encapsulated with a polysulfone or polyamide-imide resin, and is characterized by the substantial absence of any gas or vapor release at high temperatures.

3,821,016

METHOD OF FORMING AN ADHERENT METALLIC PATTERN ON A POLYIMIDE SURFACE

Michael Anthony De Angelo, Hamilton Township, Mercer Count, N.J., assignor to Western Electric Company Incorporated, New York, N.Y.

Division of Ser. No. 255,124, May 19, 1972. This application Oct. 17, 1973, Ser. No. 407,356
Int. Cl. B44d *1/50*; H05k *3/12, 3/18*
U.S. Cl. 117—47 A 5 Claims


ETCH A POLYIMIDE SUBSTRATE WITH AN ETCHANT COMPRISING A BASIC COMPOUND AND ETHYLENE DIAMINE
REMOVE ESSENTIALLY ALL TRACES OF THE ETCHANT AND/OR AN ETCHANT-POLYIMIDE REACTION PRODUCT
COAT THE ETCHED SURFACE WITH A SUITABLE PHOTOPROMOTOR
RINSE
DRY
SELECTIVELY EXPOSE THE PHOTOPROMOTOR COATED SURFACE TO A SUITABLE SOURCE OF ULTRAVIOLET LIGHT
EXPOSE THE PHOTOPROMOTOR COATED SURFACE TO A PRECIOUS METAL SALT TO REDUCE A PRECIOUS METAL THEREON
RINSE
IMMERSE THE PRECIOUS METAL REDUCED SURFACE IN AN ELECTROLESS METAL DEPOSITION BATH TO DEPOSIT AN ELECTROLESS METAL THEREON
IMMERSE THE ELECTROLESS METAL DEPOSITED SURFACE IN AN ELECTROPLATING BATH

An etching composition and a method utilizing such a composition for etching a surface of a polyimide is disclosed. The method comprises exposing the polyimide surface to an etching composition comprising an aqueous solution of a basic compound and ethylene diamine. The ethylene diamine synergistically increases the etching rate of the polyimide. When the ethylene diamine is present in an amount in excess of its degree of solubility the etching of the polyimide results in a frosted or matte finish thereof.

3,821,017

PROCESS FOR TREATING TIRE CORD FABRIC AND IMPROVED RUBBER STRUCTURES THEREFROM

Roop S. Bhakuni, Copley, and John G. Morgan, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 23, 1972, Ser. No. 265,875
Int. Cl. B32b *25/02*
U.S. Cl. 117—76 T 10 Claims

The bonding of tire cord fabric to rubber is improved by treating the surface of the fabric with a solvent solution of a polyisocyanate containing a polycarbodiimide.

3,821,018

POROUS METALLIC LAYER FORMATION

Andrew Campbell Grant, Williamsville, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 865,512, Oct. 10, 1969, abandoned. This application Sept. 21, 1970, Ser. No. 74,131
Int. Cl. B23k *1/04*
U.S. Cl. 117—94 13 Claims

A metallic porous layer is formed on copper or copper alloy base material by providing a loose coating of copper or steel powder matrix, bonding metal alloy consisting of copper and phosphorous, or copper and antimony and a liquid binder, partially heating to evolve the liquid binder and further heating to 1,350°–1,550°F. to braze the bonding metal alloy to the base material and matrix.

3,821,019

ELECTRICALLY-CONDUCTIVE CERAMIC-METALLIC PROTECTIVE COATING

Harold J. Michael, Columbus, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 93,493, Nov. 27, 1970, Pat. No. 3,702,770. This application Mar. 6, 1972, Ser. No. 232,302
Int. Cl. B44d *1/08*
U.S. Cl. 117—105.2 6 Claims

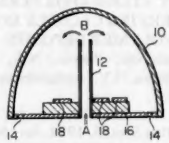
Compositions having essentially only ceramic and metallic constituents are provided for application to metal parts by conventional oxyacetylene flame spraying equipment or plasma arc spraying equipment to develop an adhering electrically-conductive protective coating to thereby provide improved metal part resistance to surface corrosion attack.

3,821,020

METHOD OF DEPOSITION OF SILICON BY USING PYROLYSIS OF SILANE

Tohru Hara, Osaka, Japan, assignor to Matsoushita Electric Industrial Company, Limited, Osaka, Japan

Filed Dec. 27, 1971, Ser. No. 211,928
Claims priority, application Japan, Dec. 28, 1970, 45-124747; Dec. 29, 1970, 45-123814
Int. Cl. C23c *11/00*
U.S. Cl. 117—106 A 1 Claim



An improved method of deposition of silicon by using pyrolysis of silane, which employs a carrier gas of a mixture of hydrogen gas and an inert gas such as argon, helium, neon, krypton, xenon, radon and nitrogen.

3,821,021
ANTISTATICALLY PROTECTED NONWOVEN POLYOLEFIN SHEET

Carl Kenneth McMillin, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 29, 1972, Ser. No. 230,448
Int. Cl. C09d *3/00*
U.S. Cl. 117—135.5 4 Claims

Nonwoven sheets comprised of film-fibril elements of an olefin polymer and bearing at least 0.1 percent by weight, preferably 0.3 to 0.4 percent by weight of a non-rewettable finish defined by the formula: $M_nR_{3-n}PO_4$ where M is selected from the group consisting of lithium, sodium, potassium, and ammonium ions, R represents an alkyl group containing 3 to 5 carbon atoms, and n is selected from the integers 1 and 2.

3,821,022
INTUMESCENT COATED CROSSLINKED POLYOLEFINS

Robert L. Rees, Bartlesville, Okla., and George E. Williams, Brighton, Mich., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 30, 1972, Ser. No. 257,873
Int. Cl. B32b *27/32*; C09d *5/18*
U.S. Cl. 117—137 8 Claims

Articles of manufacture are described comprising crosslinked polyolefins having intumescent coatings thereon. Said articles are self supporting and substantially retain the shape of the original articles even after exposure to pryolysis and/or combustion temperatures of up to 2,500° F.

3,821,023
CREASE RESISTANT FINISH FOR TEXTILES HAVING IMPROVED SOIL REPELLENT PROPERTIES

Werner Amati, Pratteln/Bl, and Richard Hochreuter, Oberwil/Bl, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Dec. 20, 1971, Ser. No. 210,116
Claims priority, application Switzerland, Dec. 22, 1970, 18949/70
Int. Cl. C08j *1/44*
U.S. Cl. 117—139.5 A 14 Claims

Compounds for the soil repellent finishing of textiles of the general formula

$$R\left[\left(\left(C_mH_{2m}O\right)_n\left(C_mH_{2m}X\right)_y R'\right)\right]_p \quad (I),$$

wherein

R stands for a p-valent radical of an organic compound which has one to 40 carbon atoms and contains at least one active hydrogen atom,

R' for hydrogen or for a saturated or unsaturated alkyl or an aromatic radical or an aliphatic carboxylic acid radical which has one to 30 carbon atoms or for the radical of an inorganic acid which may be esterified,

m for the value 2, 3 or 4,

n for zero or a value from 1 to 100,

y for zero or the value 1,

p for a value from 1 to 4

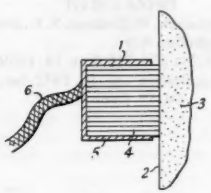
X for -NH- or -N-Z where Z is a lower alkyl radical which may be substituted;

and where the molecule has a minimum molecular weight of 100 and bears at least one free acid group are applied to textiles in conjunction with a crease-proofing N-methylol resin and a catalyst for the resin.

3,821,024
CURRENT TRANSFER BRUSHER

Geoffrey Alan Wilkin, and Ian Roderick McNab, both of Newcastle-upon-Tyne, England, assignors to International Research & Development Company Limited, Fossway, England

Filed Feb. 23, 1973, Ser. No. 335,331
Claims priority, application Great Britain, Feb. 29, 1972, 9256/72
Int. Cl. C23b *5/50*
U.S. Cl. 117—217 7 Claims



A current transfer brush is composed of refractory fibres, preferably high strength carbon fibres, with a metallic coating on the fibres which is composed of an under layer of a first metal and an over layer of a second metal. The over layer is of a highly conductive material such as silver and the under layer which improves coherence and adhesion of the over layer and thereby produces a very low brush voltage drop, is of a material such as nickel.

3,821,025
MAGNETIC RECORDING MATERIAL

Goro Akashi, and Yasuyuki Yamada, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 5, 1971, Ser. No. 186,788
Claims priority, application Japan, Oct. 5, 1970, 45-87412
Int. Cl. H01f *10/02*
U.S. Cl. 117—235 1 Claim

A thermally stable magnetic recording material comprising

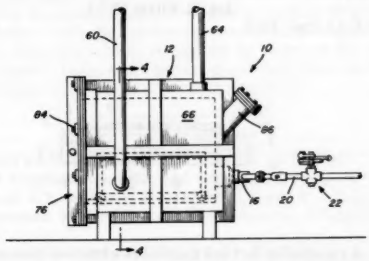
a. a support and

b. a magnetic layer, said magnetic layer being composed of a finely divided powder of ferromagnetic material, which is dispersed in a binder of a polyamide imide resin.

3,821,026
SCRAP METAL RECOVERY METHOD AND APPARATUS

Edwin H. Swartz, P.O. Box 1033, Sanford, N.C. 27330

Continuation-in-part of Ser. No. 196,126, Nov. 5, 1971, abandoned. This application Jan. 5, 1973, Ser. No. 321,264
Int. Cl. C22b *7/00*; H01b *15/00*
U.S. Cl. 134—2 8 Claims



Plastic coated scrap metal heated within a vented combustion chamber to cause decomposition of the plastic

without adversely affecting the metal core with respect to its subsequent separation from the decomposed plastic and recovery as a substantially pure metal product. A fuel gas mixture is fed at a controlled rate to the combustion chamber to initially elevate the temperature of the chamber to an optimum value that is then maintained constant. The products of combustion form a non-oxidizing atmosphere in the chamber within which the desired decomposition of the plastic occurs.

3,821,027

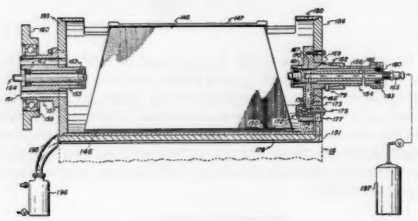
METHOD OF CLEANING ACCUMULATED MATERIAL FROM A SLOT

Raymond Keith Egnaczak, Williamson, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 876,715, Nov. 14, 1969, Pat. No. 3,673,632. This application Apr. 19, 1972, Ser. No. 245,525

Int. Cl. B08b *5/02*

U.S. Cl. 134—21 **7 Claims**



A system for removing accumulations of liquid and fine solid materials from between two movable contacting members that seal the accumulated materials in a slot where they are blasted by air to a receptacle. The blast is timed to occur when the slot is sealed between the member which carries it and a second member moving over it. An actuator releases air when the slot is sealed.

3,821,028

FUEL CELL WITH METAL CHELATE ELECTRODE CATALYST

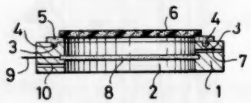
Hermann Ziener, Moglingen; Lothar Weber, Gerlingen-Schillerhohe; Horst Jahnke, Gerlingen; Horst Magenau, Stuttgart, and Georg Zimmermann, Gerlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 7, 1972, Ser. No. 260,391

Claims priority, application Germany, June 11, 1971, 2128842

Int. Cl. H01m *27/04*

U.S. Cl. 136—86 D **8 Claims**



A catalyst for fuel cell electrodes wherein a gaseous fuel or a fuel dissolved in the electrolyte of the cell is subjected to anodic oxidation, comprises a metal chelate of 5, 14-dihydrodibenzo(5,9,14,18) tetraaza(14)-annulene or an electrochemical oxidation product thereof.

The catalyst permits formation of electrodes which can be operated with an acidic electrolyte and comparatively inexpensive fuel, such as methanol, formaldehyde, formic acid, carbon monoxide, oxalic acid, etc.

3,821,029

BATTERY AND INTERCELL CONNECTOR

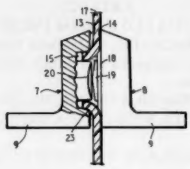
John William Smith, Sylvania, New South Wales, Australia, assignor to Chloride Batteries Australia Limited, Padstow, New South Wales, Australia

Continuation-in-part of Ser. No. 75,874, Sept. 28, 1970, abandoned. This application Aug. 22, 1972, Ser. No. 282,782

Claims priority, application Australia, Oct. 2, 1969, 61781/69; Dec. 5, 1969, 64798/69

Int. Cl. H01m *35/32*

U.S. Cl. 136—134 R **6 Claims**



This invention relates to improvements in electrical connections provided between the terminal connectors on a battery casing and their respective intercell connectors which pass through the intercell walls in multi-cell batteries. The improvement is directed towards the prevention of leakage of electrolyte through the peripheral wall of the battery casing as well as between the cells positioned therein. This is achieved mainly by deformation of the battery casing and intercell walls so that the contact surface between the battery casing and the cell wall and the respective connectors is increased.

3,821,030

SHEATHED THERMOCOUPLE

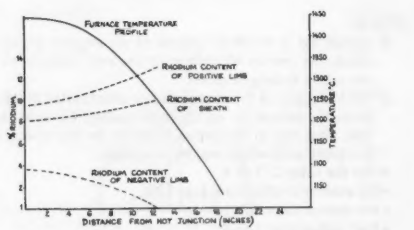
Alan Sydney Darling, Northwood, England, assignor to Johnson Matthey & Co., Limited, London, England

Continuation of Ser. No. 30,870, April 22, 1970, abandoned. This application Oct. 13, 1972, Ser. No. 297,447

Claims priority, application Great Britain, May 13, 1969, 24409/69

Int. Cl. H01v *1/14*

U.S. Cl. 136—232 **6 Claims**



An hermetically sealed metal sheathed thermocouple insulated with magnesia or beryllia wherein air or other oxidising medium is removed from the sheath before sealing.

3,821,031
METHOD FOR MANUFACTURING COLD ROLLED STEEL HAVING EXCELLENT DRAWABILITY

Haruo Kubotera; Yukio Hashimoto; Masuta Ohkubo; Hisashi Gonda, all of Kawasaki; Nobuo Tanaka, Fukuyama; Kazuo Matsudo, Fukuyama, and Takayoshi Shimomura, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Kawasaki-shi, Kanagawa-ken, Japan

Filed Dec. 24, 1970, Ser. No. 101,317

Claims priority, application Japan, Dec. 27, 1969, 44-104969

Int. Cl. C21d *7/02, 9/48*

U.S. Cl. 148—2 **4 Claims**

A method for producing cold rolled drawing quality steels containing less than 0.01% C and less than 0.50% Mn in which an inert or decarburizing gas is blown through a molten steel which is then vacuum degassed, cast either into ingots or continuously cast, hot and cold rolled and then subjected to a rapid continuous anneal at a temperature of at least 650°C. When the aluminum-killed steel is produced, aluminum is added to said molten steel in a sufficient amount to provide more than 0.02% soluble aluminum in the steel, and the hot rolled steel is coiled at a temperature above 630°C to precipitate aluminum nitride.

3,821,032
METHOD FOR OXIDIZING FERROCHROMIUM POWDERS

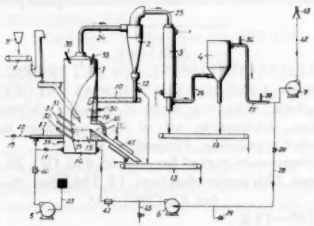
Kazuo Yamagishi, Tabaoka; Toshitugu Banba, Kawasaki, and Takeji Nakajima, Chigasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 787,020, Dec. 26, 1968, abandoned. This application Feb. 11, 1972, Ser. No. 225,411

Claims priority, application Japan, Dec. 29, 1967, 42-84730

Int. Cl. C23f *7/04*

U.S. Cl. 148—6.35 **13 Claims**



Method for oxidizing ferrochromium powders which comprises establishing a fluidized bed of ferrochromium powder by flowing upwardly through a body thereof a stream of oxygen containing gas and maintaining said fluidized bed at a temperature of from 800° to about 1,050°C without supplying additional heat once the reaction has been started up.

3,821,033
METHOD FOR PRODUCING FLAT COMPOSITE SEMICONDUCTOR SUBSTRATES

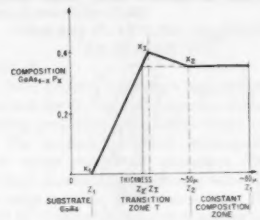
Shih-Ming Hu, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 3, 1972, Ser. No. 277,531

Int. Cl. H01l *7/36, 15/00;* **H05b** *33/00*

U.S. Cl. 148—175 **8 Claims**

A method for the deposition of single epitaxial films of ternary inorganic compounds formed from elements of Group III and V of the periodic system is described whereby warping or bowing of the deposited films is eliminated by a method comprising utilizing a non-linear intermediate transition or graded deposition region prior to the final formation of the constant composition single crystal epitaxial compound.



3,821,034
HIGH-DENSITY HIGH-ENERGY ANISOTROPICALLY PERMANENT MAGNET

Frans Frederik Westendorp; Willem Luiten, and Gijsbertus Maria Arnolds Josephus De Kort, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 871,893, Oct. 28, 1969, Pat. No. 3,615,915. This application July 16, 1971, Ser. No. 163,472

Claims priority, application Netherlands, Oct. 31, 1968, 6815510

Int. Cl. H01f *1/04*

U.S. Cl. 148—31.57 **2 Claims**

A permanent magnet consisting of a compact mass of magnetically anisotropic powder having a theoretical density of which is at least 85 percent of the theoretical density and the magnetization in the direction of magnetization is at least 90 percent of the saturation magnetization.

3,821,035
SINTERED COBALT-NEODYMIUM-SAMARIUM INTERMETALLIC PRODUCT AND PERMANENT MAGNETS PRODUCED THEREFROM

Donald L. Martin, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 1, 1972, Ser. No. 249,362

Int. Cl. H01f *1/04*

U.S. Cl. 148—31.57 **1 Claim**

Novel sintered cobalt-rare earth intermetallic products are used to form permanent magnets having unique properties. The sintered product is comprised of intermetallic compounds of cobalt and rare earth metals composed of samarium and neodymium. Cobalt is present in an amount of about 62 to 66 percent by weight of the product and the rare earth metals are present in an amount of about 34 to 38 percent by weight of the product with the neodymium component ranging in amount from about 20 to 90 percent by weight of the rare earth content. Permanent magnets are formed from the sintered product in bulk form or in particulate form.

3,821,036
OXYREACTION STRENGTHENING OF METALS

Mark I. Copeland, Corvallis, and William L. O'Brien, Albany, both of N.Y., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

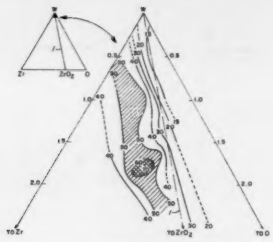
Filed May 15, 1972, Ser. No. 253,032

Int. Cl. B22f *3/24*

U.S. Cl. 148—126 **16 Claims**

Oxyreaction strengthening of base metals and their alloys is accomplished by a powder metallurgical technique in which a

base metal powder containing oxygen is blended with a reactive metal powder, and then pressed, sintered, densified if desired, and held below the sintering temperature to form an ultrafine dispersion of reactive metal oxide throughout the



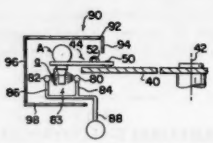
base metal. Preferred base metals include the Periodic Table metals of Groups IB, VIB, and VIII while preferred reactive metals include silicon, aluminum and Periodic Table elements of Group IVB.

3,821,037

METHOD AND APPARATUS FOR COOLING LOCALLY HEATED WORKPIECES

James J. Snyder, Summit, and Frederick A. Schuckert, Cuyahoga, both of Ohio, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Dec. 1, 1971, Ser. No. 203,692
Int. Cl. C21d *1/42, 9/36*
U.S. Cl. 148—145 **1 Claim**



A method and apparatus particularly adapted to cool hardened workpieces which have been locally heated for annealing purposes. In accordance with the invention, once a workpiece has been locally heated to a temperature above its critical temperature, it is immediately passed through a cooling zone having a plurality of water nozzles disposed therealong to provide a low velocity water fog within the zone and particularly against the heated portion of the workpiece in order to cool the workpiece at a rate below the critical cooling rate and to prevent the unheated portion from being conductively heated and thereby softened.

3,821,038

METHOD FOR FABRICATING SEMICONDUCTOR STRUCTURES WITH MINIMUM CRYSTALLOGRAPHIC DEFECTS

Guenter Helmut Schwuttke, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1972, Ser. No. 255,468
Int. Cl. H01l *7/44*
U.S. Cl. 148—186 **5 Claims**

A method for manufacturing semiconductor bipolar devices and structures comprising carrying out processing steps such as diffusion, reoxidation, epitaxial deposition, isolation and similar process steps, at a processing temperature range in which the conductivity dopant or impurity exhibits maximum solubility in the semiconductor material thereby minimizing crystallographic dislocations which render subsequent device structures defective.

3,821,039

METHOD OF EPITAXIALLY DEPOSITING A SEMICONDUCTOR MATERIAL ON A SUBSTRATE

Michael Ettenberg, Freehold, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 22, 1973, Ser. No. 343,911
Int. Cl. H01l *7/38*
U.S. Cl. 148—171 **5 Claims**

In epitaxially depositing a layer of a single crystalline semiconductor material on a substrate by liquid phase epitaxy where there is a relatively large lattice mismatch between the semiconductor material and the material of the substrate, the semiconductor layer is deposited on a roughened surface of the substrate.

3,821,040

FORMATION OF SHALLOW P-N JUNCTIONS IN PbSnTe BY DIRECT DIFFUSION

Shirley L. Wakefield, and Vernon L. Lambert, both of Cincinnati, Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Jan. 2, 1973, Ser. No. 320,170
Int. Cl. H01l *7/44*
U.S. Cl. 148—189 **7 Claims**

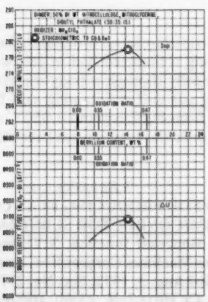
This invention is a method of forming a shallow, i.e., less than 1 micron (μ), p-n junction by direct diffusion. The junction is in lead-tin-telluride for diodes which are subsequently used to produce infrared detectors. The junction is produced directly from a wafer without the necessity of using conventional time-consuming back etching. The steps of the method comprise taking wafers prepared as in U.S. Pat. No. 3,673,063, Production of Lead-Tin-Telluride Material for Infrared Detectors, annealing the sliced and polished wafers in the simultaneous presence of an inert gas below atmospheric pressure and of a metal-rich powder at a temperature well below the melting point of $[Pb_{1-x}Sn_x]Te$ for a short time to form a thin top layer of n material on the original p material.

3,821,041

BERYLLIUM CONTAINING ROCKET PROPELLANTS PRODUCING MAXIMUM BOOST VELOCITY

Arch Scurlock, Arlington; Keith E. Rumbel, Oakton, and M. Lee Rice, Alexandria, all of Va., assignors to Atlantic Research Corporation, Alexandria, Va.

Continuation-in-part of Ser. No. 65,856, Oct. 28, 1960, abandoned. This application Sept. 12, 1963, Ser. No. 309,369
Int. Cl. C06d *5/06*
U.S. Cl. 149—19.8 **20 Claims**



1. In a rocket propellant composition which burns to produce propulsive gases and which consists essentially of a

finely-divided, solid, inorganic oxidizer containing combined oxygen which it yields readily for combustion of the fuel components of said composition, and a finely-divided beryllium-containing fuel selected from the group consisting of beryllium, beryllium hydride and mixtures thereof dispersed in an organic fuel matrix comprising at least about 20 per cent by volume of said composition, the improvement in which the oxidizer, the beryllium-containing fuel, and the organic fuel matrix are present in amounts such that the oxidation ratio as defined by the following expression:

$$O/O + C + M \text{ equals about } 0.47 \text{ to } 0.60$$

wherein O equals the total amount of combined oxygen in the composition, C equals the total amount of carbon, and M equals the amount of beryllium, said O, C and M being expressed in terms of the number of atomic equivalents.

3,821,042

COMPOSITE PROPELLANT CONTAINING MOLYBDENUM TO REDUCE ELECTROMAGNETIC RADIATION INTERFERENCE IN COMBUSTION PRODUCTS

Howard G. Cutforth, Los Altos; Clarence A. Le Febvre, and Melvin E. Steinle, both of San Jose, all of Calif., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed July 31, 1967, Ser. No. 657,001

Int. Cl. C06d *5/06*

U.S. Cl. 149—19.4 **2 Claims**

Solid propellant compositions containing molybdenum exhibit improved castability characteristics and when burned exhibit substantially lower radar interference.

3,821,043

HYDRAZINE GEL COMPOSITION

Nathan J. Sippel, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 2, 1966, Ser. No. 578,421

Int. Cl. C06d *5/08*

U.S. Cl. 149—36 **9 Claims**

Gelled fuel compositions comprising an amine fuel and a commercially available polymer containing mannose, glucose, potassium glucuronate and acetyl; also mixtures of the present gelled amine fuel and gelled petroleum fuels. These gelled fuels are mechanically stable at from −65° F to 165° F and have excellent suspending properties for solid particles which provide performance gains measured by burnt velocity.

3,821,044

STABILIZATION OF ALUMINUM HYDRIDE

Charles B. Roberts, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 24, 1968, Ser. No. 740,831

Int. Cl. C06b *19/00*; **C01b** *6/00*

U.S. Cl. 149—109 **8 Claims**

The invention is a process for upgrading the thermostability of light metal hydrides, particularly substantially non-solvated, crystalline aluminum hydrides, which may contain small amounts of magnesium values, by contacting the hydride with an aqueous solution buffered at from about pH 6 to about 8, preferably at about 7, at a maximum temperature of about 70° C., preferably about room temperature, for a period of time and separating the so-treated product from the aqueous solution. Crystalline Aluminum hydride is useful as a fuel component in rocket propellants.

3,821,045

MULTILAYER SILICON WAFER PRODUCTION METHODS

George Wolfe, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 17, 1972, Ser. No. 272,706

Int. Cl. G23f *1/02*

U.S. Cl. 156—3 **3 Claims**

One of three process sequences are used depending upon the desired end result. The first sequence represents a method for fabricating prototype, pilot line or proof of design system function. The second and third sequences are primarily directed at larger production quantities. These latter two sequences both incorporate processing where individual wafer identity is deferred to a later process step. This result is accomplished by altering the process sequence in order to place a 100 percent electrical testing and corresponding yield mapping operation at a point closer to the final process step. They differ in the manner in which pad relocation and signal routing metallization layers are formed. The second process sequence employs a metallization evaporation operation followed by a direct photoresist masking and etching operation, whereas the third sequence employs a reverse masking technique to form metallization layers. The present invention relates to methods for economical batch production of complex system functions on a whole or partial semiconductor wafer.

3,821,046

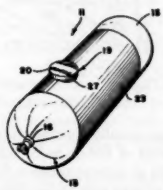
METHOD OF MAKING DISPENSERS

Heinz F. Runge, Niles, Ill., assignor to Kraftco Corporation, New York, N.Y.

Continuation of Ser. No. 861,385, Sept. 26, 1969, abandoned. This application Dec. 6, 1971, Ser. No. 205,277

Int. Cl. B29c *23/00*

U.S. Cl. 156—69 **7 Claims**



A method and apparatus are provided for feeding packages, dispensing nozzles and attaching strips and for securing the strips on the packages to hold the dispensing nozzles in position on the packages for dispensing the contents of the packages upon a squeezing thereof.

3,821,047

METHOD OF SOLVENT SEALING PLASTIC FILM CASSETTE SEAMS

Horst Schruff, Mulheim-Ruhr; Helmut Lehmann; Jakob Siefen, both of Leverkusen; Hermann Mathner, Koln; Willi Adams, Leverkusen, and Gunter Weib, Koln, all of Germany, assignors to Agfa-Gevaert Aktiegesellschaft, Leverkusen, Germany

Division of Ser. No. 108,524, Jan. 21, 1971, Pat. No. 3,700,531. This application Aug. 16, 1972, Ser. No. 280,981

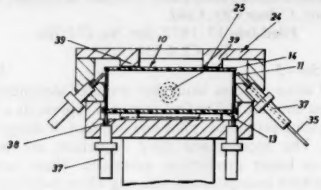
Claims priority, application Germany, Feb. 21, 1970, 2008103

Int. Cl. C09j *5/00*; **B32b** *31/22*

U.S. Cl. 156—69 **4 Claims**

A synthetic plastics film cassette which consists of a cassette body covered by a U-shaped cassette cover is closed by spray-

ing a solvent between the cover and body of the cassette. The spraying arrangement consists of several measuring cylinders



and pistons, with which certain positions on the cassettes are sprayed with solvents through thin tubes.

3,821,048

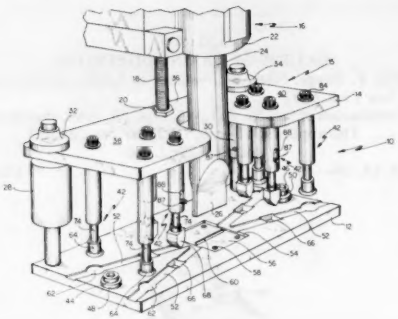
ULTRASONIC RIBBON SPLICER

Donald F. Acker, Homer, and Dietrich J. Klein, Cortland, both of N.Y., assignors to SCM Corporation, New York, N.Y.

Filed Mar. 2, 1973, Ser. No. 337,355

Int. Cl. B29c *27/08*

U.S. Cl. 156—73 **22 Claims**



A method for ultrasonically splicing ribbons which consists of placing the segments of ribbon to be spliced in a fixture to position the segments in proper relation for maximum splice strength, tensioning at least one of the ribbon segments, compressing the ribbon with an ultrasonic welding device against an anvil, and then actuating the ultrasonic welding device to produce relative motion between the ribbon segments to heat the ribbon material sufficiently to fuse the segments.

The method of ultrasonically welding the segments of ribbon is accomplished by means of apparatus having positioning grooves in which the ribbon segments to be spliced are placed. Positioning pads are provided which automatically fix the ribbon in position in the ribbon grooves during the splicing operation. Ribbon tensioning feet press on at least one of the ribbon segments to gather a portion of the ribbon in a depression coacting with the tensioning feet, thereby tensioning the ribbon for ultrasonic welding.

3,821,049

METHOD FOR CONSTRUCTING A PHOTOGRAPHIC FILM ASSEMBLAGE

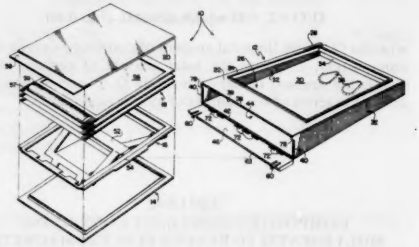
Nicholas Gold, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 163,212, July 16, 1971, Pat. No. 3,748,983. This application Dec. 21, 1972, Ser. No. 317,541

Int. Cl. B32b *31/20*

U.S. Cl. 156—73 **2 Claims**

An improved container for receiving and supporting photographic materials including a plurality of film units. An opening, defined by leading ends of a forward, rear, and a pair of side walls of the container, is provided for inserting the materials into the container. Thereafter a leading end wall is adapted to be ultrasonically bonded to the leading ends of the side and rear walls to partially close the opening and cooperate with the forward wall to define a withdrawal aperture through which the film units may be sequentially extracted from the container after exposure. The effective opening of the



withdrawal aperture is controlled by a stop integrally formed with the leading end wall and adapted to be accurately spaced from an interior surface of the forward wall to insure that only one film unit at a time may be withdrawn from the container. Cooperating structure is provided at the interface between the rear wall and the leading end wall to insure accurate positioning of the stop with respect to the interior surface of the forward wall during an ultrasonic bonding cycle.

3,821,050

FLEXIBLE HOSE

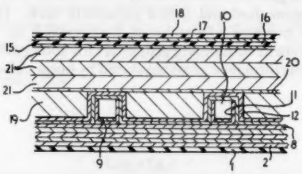
John Ambrose, and Edmund J. Shepherd, both of Grimsby, England, assignors to The Dunlap Company Limited, London, England

Division of Ser. No. 105,298, Jan. 11, 1971, Pat. No. 3,717,180. This application July 18, 1972, Ser. No. 272,752

Claims priority, application Great Britain, Jan. 14, 1970, 1758/70; June 10, 1970, 28111/70

Int. Cl. B29d *23/10*

U.S. Cl. 156—143 **8 Claims**



A process for manufacturing flexible hose in which spaced-apart reinforcement rings are fitted to the hose. The rings are of resinous material and contain reinforcement filaments. The resinous material may be applied in an uncured condition and may be applied into channel-section rings which act as moulds for the reinforcement rings, the resinous material being subsequently cured during vulcanisation of the hose assembly, of which the following is a specification.

ERRATUM

For Class 156—190 see: Patent No. 3,820,583

3,821,051

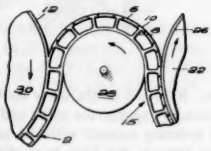
PROCESS FOR BONDING RIB STRUCTURES OF THERMOPLASTIC RESIN

Michael Somerville Withers, Landenberg, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 831,145, June 6, 1969, abandoned. This application Dec. 16, 1970, Ser. No. 98,852

Int. Cl. B29d 23/10; B32b 3/12, 3/04

U.S. Cl. 156—203 5 Claims



Ribbed structure laminate is provided comprising a film of thermoplastic resin heat-bonded to the tops of a plurality of ribs which are in turn integrally molded at their base with another film of thermoplastic resin, with the junction between the first-mentioned film and the tops of the ribs being in the form of a smooth transition between the film and a flange formed along the top of each rib. The laminate is useful as a material of construction such as for packaging, heat exchangers and insulation. The laminate can be made by maintaining the ribs in contact with a heated release surface so as to form a molten flange along the top of each rib, progressively removing the molten flanges from the release surface, and progressively contacting the molten flanges with a film of heated thermoplastic resin. This process is also applicable to the bonding of other thermoplastic resin objects, surface-to-edge or edge-to-edge, together.

3,821,052

METHOD OF ATTACHING PLATE MEMBERS TO EACH OTHER

John Tanzer, 411 N. 7th St., St Louis, Mo. 63101

Filed Oct. 4, 1971, Ser. No. 186,278

Int. Cl. B32b 31/00, 3/10

U.S. Cl. 156—250 1 Claim

A method of attaching plate members to each other is disclosed wherein a solid mass of adhesive material extends from one of the plate members to be adhesively attached to the other plate member through the application of heat and pressure. One or both of the plate members may be provided with an aperture through which the adhesive material can be caused to flow to form a rivet-like head on the rear face of each aperture panel and provide a mechanical connection between the panel members.

3,821,053

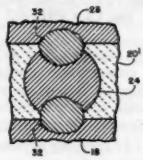
THERMOCOUPLE AND METHOD OF MAKING SAME

Paul D. Wilcox, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 20, 1972, Ser. No. 290,685

Int. Cl. B32b 31/00; B01j 17/00; H01v 1/00

U.S. Cl. 156—257 9 Claims



A method for making thermocouples and the thermocouples produced thereby including superposing an elongate conductive member and a normally solid, electrically insulative and binder material between first and second layers of thermoelectric material, heating the sandwiched assembly to at least partially liquidize or soften the insulative material and pressing the conductive member against the thermoelectric material layers, continuing the heating and pressing to join or react the conductive member with the thermoelectric material layers and wet the thermoelectric materials and conductive member surfaces in contact with liquidized insulative material, and then cooling the materials to solidify and bind the same together. The thermoelectric materials are of different conductivity types and additional layers of insulative materials, conductive members and thermoelectric materials of alternating conductivity types may be stacked and pressed and heated.

3,821,054

METHOD OF CHEMICAL BONDING OF POLYIMIDE POLYMERS

Elena Borisovna Trostyanskaya, Ulitsa Gotralda, 20, Kv. 38; German Vyacheslavovich Komarov, Ulitsa Bolshaga Pochtovaga, 18/20, Karpus 5 Kv, 14, and Jury Sergeevich Tsarakhov, Ulitsa Nagornaga, 27, Korpus 32, Kv. 59, all of Moscow, U.S.S.R.

Filed Oct. 15, 1971, Ser. No. 189,782

Int. Cl. C09j 5/00

U.S. Cl. 156—308 11 Claims

A method for chemically bonding polyimide articles characterized in that polyfunctional substances, for example polyamines, polyisocyanates and others are supplied to the surfaces to be bonded and the surfaces are then pressed together with heating. The said polyfunctional substances react chemically with the functional groups of polyimides to form chemical bonds between the surfaces to be bonded, to the effect of producing high-strength seams that can work within a wide range of working temperatures for polyimides.

3,821,055

FABRIC PATTERN CONSTRUCTION METHOD

Charles W. Fairbanks, Saint Paul, and Roger W. Leinen, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St., Minn.

Filed Dec. 23, 1971, Ser. No. 211,720

Int. Cl. C09j 5/00; B32b 31/12; A41h 3/00

U.S. Cl. 156—309 10 Claims

A method for construction with fabrics, and the like comprising temporarily securing fabric pieces by means of an aerosol spray of a normally tacky pressure-sensitive adhesive composition comprising a dispersion of an adhesive in a propellant at autogenous pressure, the dispersion having a

particularly low penetration value and the adhesive having initial and subsequent peel resistances within defined, and relatively low, ranges.

3,821,056
METHOD OF BONDING HYDROXYL CONTAINING SUBSTRATES

Joseph Edward Reardon, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

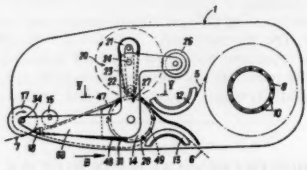
Filed Apr. 7, 1972, Ser. No. 242,228
Int. Cl. C09j *5/02*
U.S. Cl. 156—331 **10 Claims**

Method of bonding together two substrate surfaces each having a chemical composition containing free hydroxyl groups such as cellulose or fiber glass-reinforced polyester in which (1) each substrate surface is coated with a polyisocyanate such as the reaction product of toluene diisocyanate and trimethylol propane, (2) applying between and in contact with the coated surfaces a layer of thermoplastic adhesive composition comprising thermoplastic segmented copolyester elastomer, and (3) applying heat to the area of the bond.

3,821,057
PRICE MARKER

Josef Grasmann, 32/3 Post Frantenfels, Weissenbach, Austria

Filed Jan. 13, 1971, Ser. No. 106,159
Claims priority, application Austria, Jan. 16, 1970, 429/70
Int. Cl. B32b *31/00*
U.S. Cl. 156—384 **4 Claims**



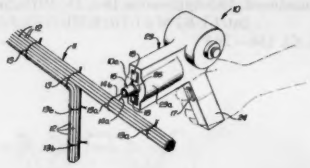
In a hand-held price marker, a backing strip detachably carrying a sequence of presure-sensitive adhesive labels is guided over a deflecting edge where the labels are stripped from the backing strip and dispensed under a press-on roller which applies the labels to a surface. Aprinting mechanism is mounted in the path of the labels for eccentric rotation into a printing position and an inking position, a roatable backing roller supporting and guiding the backing strip in the printing position and an inking device adjacent the type faces of the printing mechanism in its inking position. A non-slip driving connection between the press-on roller and the printing mechanism spindle causes the latter to rotate at the same peripheral speed as the roller when the same applies a printd label, and the rotating printing mechanism drives the backing roller by one label width at a time.

3,821,058
HARNESS CABLE LACING TOOL

Alan R. Miller, Downey, Calif., assignor to EDN Corporation, Los Angeles, Calif.

Filed May 25, 1972, Ser. No. 256,781
Int. Cl. B31f *1/00*
U.S. Cl. 156—468 **11 Claims**

A tool for fastening a length of thermoplastic resin coated lacing tape around a cable is characterized by means for twisting together the lacing tape ends, heating means for fusing the twisted ends, and means for severing the cable securing tape loop from the supply. Preferably the tool is pistol-shaped and houses a motor which rotates a tubular drive shaft having a twisting member at the muzzle end. The heating and severing means are contained in jaws retracted in the tool barrel and connected to a carrier threadingly engaging a drive screw on the drive shaft exterior. Lacing tape supplied through the shaft is looped around the cable and the free end attached to the

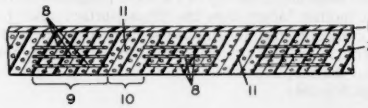


twisting member. Rotation of the drive shaft simultaneously twists the tape securely against the cable and extends the jaws into fusing and severing contact with the tape twisted ends. Counter-rotation retracts the jaws in readiness for the next lacing operation. Alternatively, the jaws may be solenoid actuated.

3,821,059
SEGMENTALLY ACCOMMODATING LOOSE-LAY FLOOR

Robert D. Hensel, Millersville, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Apr. 5, 1972, Ser. No. 241,358
Int. Cl. B32b *3/10*
U.S. Cl. 161—36 **1 Claim**

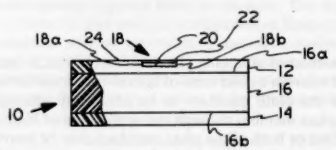


A decorative loose-lay surface covering having a resilient thermoplastic decorative wear layer and a resilient foamed thermoplastic backing layer specifically adapted for absorbing movement between the loose-lay surface covering and the subfloor with which it is in contact. The backing layer is constructed such that there are a plurality of rigid elements separated by a resilient and compliant matrix in a plane parallel to the upper surfaces of the covering and subfloor.

3,821,060
MAGNETICALLY CODABLE MACHINE READABLE POLYMERIC ARTICLE

Joseph F. Braca, Huntington, and John E. Hynes, Danbury, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

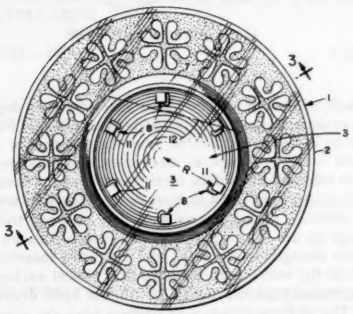
Continuation-in-part of Ser. No. 161,118, July 9, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 313,959
Int. Cl. B32b *3/08, 3/22;* **G11b** *3/82*
U.S. Cl. 161—39 **2 Claims**



A magnetically codable article of manufacture and a method for making same are described. The finished articles

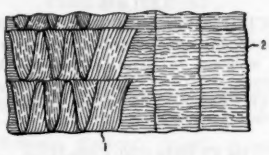
of manufacture comprise a polymeric matrix of some rigidity having magnetic tape stripes integrally bonded therein on a plane with and in close proximity to the surface thereof in order that the said magnetic tape stripe can be conveniently read by such information retrieval equipment ordinarily employed for such purpose. The magnetic tape stripe is incorporated into the polymeric matrix by a heated-fushion bonding, under pressure, to yield a finished polymeric article of manufacture having said magnetic tape stripe integrally bonded therein, substantially flush with a surface thereof, said surface possessing very desirable physical characteristics.

3,821,061
SERVING UTENSIL FOR FRUITS
Robert W. Schier, 1828 Wagner Rd., Glenview, Ill. 60025
Filed Aug. 4, 1972, Ser. No. 278,111
Int. Cl. B32b *3/02*; **B65d** *1/34*
U.S. Cl. 161—42 **11 Claims**



A serving utensil for fruits, especially melons and citrus fruits such as grapefruit and oranges, characterized by a concave base or portion having a rounded rim and a plurality of sharply-pointed rind or skin penetrating, fruit gripping members on supports extending upwardly from the concave portion, the pointed members being near to and above the rim.

3,821,062
NONWOVEN POLYPROPYLENE FABRIC
William Weldon Henderson, Seaford, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Feb. 16, 1972, Ser. No. 226,766
Int. Cl. B32b *5/12*
U.S. Cl. 161—59 **3 Claims**

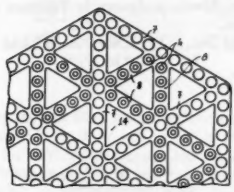


A length of layered nonwoven bonded continuous filament isotactic polypropylene fabric having a high level of unlatexed tear strength at a reasonable level of neckdown and which retains a high proportion of this tear resistance even after latexing.

3,821,063
INSULATING MATERIAL
George D'Olier, Devon, Conn., assignor to Raybestos-Manhattan, Inc., Stratford, Conn.
Filed Apr. 28, 1972, Ser. No. 247,445
Int. Cl. B32b *5/12, 13/12*; **B01j** *9/00*
U.S. Cl. 161—60 **6 Claims**

An asbestos sheet material, particularly suitable for use as thermal insulation in an emission control device for internal combustion engines, consisting of chrysotile asbestos fibers and elastomeric binder comprising a high molecular weight copolymer of butadiene, the major portion of the asbestos fibers in the sheet being oriented in substantially parallel relation with respect to each other. Prior to use, the sheet is heat treated at a temperature of 525° to 575°F. for a period of time to cause a weight reduction of 8–10 percent.

3,821,064
MAN-MADE SKI SLOPES
Francesco Cima, 24015 San Giovanni Bianco, Italy
Filed Apr. 5, 1972, Ser. No. 241,228
Claims priority, application Italy, Apr. 8, 1971, 2908/71
Int. Cl. B32b *3/06*
U.S. Cl. 161—62 **25 Claims**

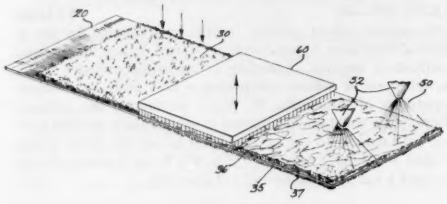


A linear plastic structural shape, supporting the stems, having a width comprised between 0,4 and 2 cm and is arranged with like shapes so as to form a discontinuous surface defined by suitable geometrical figures which are variable depending on the type of sking for which the surface is designed. The linear shape has a rounded off upper surface or inclined walls. The discontinuous sliding surface is provided with empty or lightening zones of limited surface area which are delimited by the aforesaid shapes consisting of plastic and supporting the stems. The flexible stems, consisting also of plastic material, are fixedly secured perpendicular to the plastic shape, and have a conical, fractionated or feathered configuration, with the upper apexes rounded off, the length and width of the stems depending upon the type of skiing to be performed. The stems may be of the same or different lengths and may be joined or connected to each other at their upper ends.

3,821,065
FOAM-FIBROUS PAD
Richard S. Copeland, Grand Rapids, and Frederick D. Peters, Comstock Park, both of Mich., assignors to Sackner Products, Inc., Grand Rapids, Mich.
Filed Apr. 6, 1972, Ser. No. 243,279
Int. Cl. B32b *5/06, 5/18*
U.S. Cl. 161—67 **9 Claims**

A foam-fibrous pad and method for making the same, the pad comprising a layer of fabric sheeting, a layer of fibers and a layer of foam. The fibers are needled into the sheeting to form composite backing and the fiber side of the composite backing is then sprayed or otherwise coated with a fine coating of heat-sensitive, pressure sensitive, contact sensitive, adhesive or any other adhesive with a controlled degree of adhesion. The foam layer is combined with the adhesive-sprayed or coated fiber side of the composite backing to form the

complete pad while overfeeding the foam and simultaneously needling the composite to the foam. The overfeeding produces a curvature away from the foam layer which facilitates application of the pad to small radius curves. The



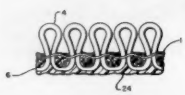
final step is to partially adhere the foam to the backing by means of the adhesive with heat or other means depending on the type of adhesive used, thereby premanently bonding the several layers in their curved state.

3,821,066

CARPET AND METHOD OF MAKING

Neil E. Tillotson, Dicksville Notch, N.H., and Sebastian A. Consoli, Lawrence, Mass., assignors to Tillotson Corporation, Needham, Mass.

Filed Dec. 6, 1972, Ser. No. 312,666
Int. Cl. D03d *27/06*
U.S. Cl. 161—67 **14 Claims**



A tufted carpet coated with a fused thermoplastic resin on the underside of a tufted primary backing is formed by impregnating the primary backing with a liquid plasticizer either undiluted or diluted with a solvent for the plasticizer, coating the underside of the primary backing with a solid resin powder capable of being plasticized by the plasticizer and fusing the resin coating by heating. The primary backing can be tufted subsequent to impregnation and preferably prior to impregnation with the plasticizer. In one embodiment a secondary backing, either impregnated with plasticizer or containing no plasticizer is applied to the resin coating either prior to or during the time the resin is fused to adhere the primary backing to the secondary backing.

3,821,067

FIRE RETARDANT POLYURETHANE COMPOSITIONS

Robert C. Taylor, King of Prussia, Pa.; Robert Koncos, Morrestown, N.J., and Joseph A. Meyers, III, Newtown Square, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed July 5, 1973, Ser. No. 376,495
Int. Cl. D04h *11/00*
U.S. Cl. 161—67 **1 Claim**

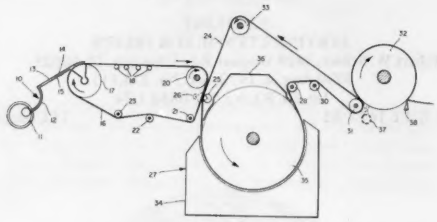
Fire retardant polyurethane compositions having good tensile and tear strength are formed comprising a liquid, hydroxyl-terminated diene polymer, a low molecular weight reinforcing polyol, an isocyanate, a filler, a fire retardant compound, and a catalyst. The resulting compositions find particular application as thixotropic polyurethane adhesive compositions applied to the underside of the primary fabric backing of tufted carpet as either a laminating adhesive, a precoat adhesive or a unitary carpet backing.

3,821,068

SOFT, ABSORBENT, FIBROUS, SHEET MATERIAL FORMED BY AVOIDING MECHANICAL COMPRESSION OF THE FIBER FURNISH UNTIL THE SHEET IS AT LEAST 80% DRY

David L. Shaw, Philadelphia, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Oct. 17, 1972, Ser. No. 298,347
Int. Cl. D21f *9/02*; **B31f** *1/14*
U.S. Cl. 162—111 **12 Claims**



A soft, absorbent, creped paper web formed by deposition from an aqueous slurry of principally lignocellulosic fibers and dried to at least 80 percent fiber consistency or dryness without being subjected to mechanical compression of the web to substantially reduce formation of papermaking bonds which would form upon compression of the web while wet. The resultant uniform density web is adhered to a dryer through the use of a creping adhesive (which does not add significant strength to the web) and is creped therefrom. The fibers in the web are bonded together almost exclusively by conventional papermaking bonds formed upon drying of the web. The uniform density web product has a dry basis weight of from about 10 to 30 lbs/ 2,880 feet^2, a TEA-to-stiffness ratio greater than 0.5×10^{-4}, and an average calculated density throughout it thickness under no load of less than 0.3 grams per cubic centimeter.

3,821,069

PROCESS OF SIZING PAPER WITH A REACTION PRODUCT OF MALEIC ANHYDRIDE AND AN INTERNAL OLEFIN

Otto B. Wurzburg, Whitehouse Station, N.J., assignor to National Starch and Chemical Corporation, New York, N.Y.

Filed Jan. 2, 1973, Ser. No. 319,980
Int. Cl. D21d *3/00*
U.S. Cl. 162—158 **9 Claims**

A method of sizing paper in which the paper is sized with the reaction product of maleic anhydride and an internal olefin.

3,821,070

PRODUCING NOVEL SILICON DIOXIDE FIBERS

Manfred Mansmann, and Gerhard Winter, both of Krefled, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 9, 1971, Ser. No. 170,381
Claims priority, application Germany, Aug. 20, 1970, 2041321
Int. Cl. D02g *3/00*; **C04b** *35/64*
U.S. Cl. 161—172 **11 Claims**

Silicon dioxide fibers are produced by dry spinning a hydrolysis solution containing poly-lower alkylene oxide, especially polyethylene oxide of high molecular weight, the product preferably being post-heat treated to a temperature of about 200° to 1,500°C at a controlled rate of heating either in an oxygen containing or in an inert atmosphere to produce

novel fibers as characterized by physical properties and amorphous X-ray diagram. The hydrolysis is effected with less than about 3 moles of water per mole of alkoxy group contained in a tetraalkoxysilane or alkoxypolysiloxane and in the presence of a small amount of hydrochloric acid and a lower alkanol solubilizing agent.

3,821,071
SAFETY PANES

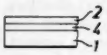
Karl Dietzel, Krefeld-Verdingen; Gunter Peilstocker, Krefeld-Bockum; Karl-Heinrich Meyer, Krefeld-Bockum, and Hugo Streib, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 55,256, July 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 754,269, Aug. 21, 1968, abandoned, which is a continuation-in-part of Ser. No. 360,749, April 17, 1964, abandoned. This application Dec. 13, 1971, Ser. No. 207,506

Claims priority, application Germany, Apr. 20, 1963, 39537; May 22, 1963, 39814; June 20, 1963, 40066; June 20, 1963, 40068; June 20, 1963, 40070; June 20, 1963, 40072; June 20, 1963, 40074

Int. Cl. B32b *17/06, 27/06*

U.S. Cl. 161—183 **1 Claim**



A polycarbonate sheet and a glass sheet slidably mounted one on the other in face to face relationship.

3,821,072
LAMINATING PROCESS AND ARTICLE PRODUCED THEREBY

Robert W. Campbell, and Oren L. Marrs, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 5, 1972, Ser. No. 269,097

Int. Cl. B32b *27/34, 15/08*

U.S. Cl. 161—214 **20 Claims**

Adhesives useful for uniting the surfaces of various elements are provided comprising a substantially amorphous polyamide or poly(amide-imide) prepared by polymerization of at least one of bis(4-aminocyclohexyl)methane (PACM) or 2,2-bis(4-aminocyclohexyl)propane (PACP) or methyl derivatives thereof with at least one polycarboxylic acid or a crystalline polymer of bis(4-aminocyclohexyl)methane (PACM) and azelaic acid. The polymeric compositions can be applied to surfaces as a hot melt adhesive or solvent cement.

ERRATUM

For Class 162—111 see:
Patent No. 3,821,068

3,821,073
MULTI-LAYER PAPER FORMATION WHEREIN OUTER LAYERS ARE SUBSTANTIALLY FREE OF BOD SUBSTANCES

Erik Sture Eriksson, Karlstad, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

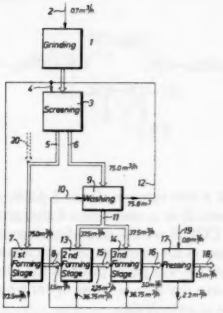
Filed Oct. 2, 1972, Ser. No. 294,020

Claims priority, application Sweden, Oct. 15, 1971, 13117/71

Int. Cl. D21f *1/80, 11/04*

U.S. Cl. 162—126 **13 Claims**

In a process for the manufacture of paper or a similar fibre sheet product the initial fibre-stock suspension, which contains BOD substances, is divided into two fibre suspension flows. One of these fibre suspension flows is conveyed to a first sheet forming stage wherein a first fibre layer is formed and dewatered. The second fibre suspension flow is first subjected to a washing process in which the original suspension water containing BOD substances is exchanged for new suspension water which is substantially free from BOD substances, and is after this washing process conveyed to one or more additional sheet forming stages wherein one or more additional fibre layers are formed and dewatered. These additional fibre layers



are joined with the first fibre layer from the first sheet forming stage into a multi-layer fibre web, which is passed through a press section for further dewatering. The backwater from the first sheet forming stage and the exchanged suspension water containing BOD containing substances from the washing process is recirculated to the initial fibre-stock suspension. The backwater from the additional sheet forming stages and from the press section is preferably recirculated to the washing process and used therein for the substitution of the original suspension water containing BOD containing substances in the second fibre suspension flow.

3,821,074
PAPER FROM PITCH BASED ORGANIC FIBERS

Ruey Y. Lin, Williamsville; Hari N. Murty, Grand Island, and Anthony J. Pietrantuone, Tonawanda, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Dec. 7, 1972, Ser. No. 313,007

Int. Cl. D21h *5/12*

U.S. Cl. 162—146 **14 Claims**

Bonded fibrous articles are made from mixtures of fusible and infusible pitch-novolac fibers, as well as similar mixtures of fusible and infusible novolac fibers. The fibrous mixtures are formed into the desired shapes and the fusible fibers are cured, forming firm bonds with the infusible fibers during the curing step. The resulting fibrous articles show excellent dimensional stability as well as chemical and thermal resistance. The fibers may be formed into flat sheet-like products which are suitable as thermal and electrical insulators and show good resistance against chemical attack.

ERRATUM

For Class 162—158 see:
Patent No. 3,821,069

3,821,075

C21-DICARBOXYLIC ACID ANHYDRIDE AND SIZE AGENTS AND SIZING PROCESS

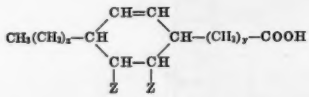
Alan M. Bills, Summerville, S.C., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 254,626, May 18, 1972, abandoned. This application Oct. 18, 1973, Ser. No. 407,734

Int. Cl. D21h *3/08*

U.S. Cl. 162—179 6 Claims

There is disclosed a dicarboxylic acid anhydride made from a C_{21}-dicarboxylic acid having the following general formula



wherein x and y are integers from 3 to 9, x and y together equal 12, where Z is a member of the group consisting of hydrogen and COOH, with Z one of each moiety. There is also disclosed a process for sizing paper which comprises intimately dispersing within wet pulp, prior to the ultimate conversion of said pulp into a dry web, a sizing agent which includes a C_{21}-dicarboxylic acid anhydride.

3,821,076

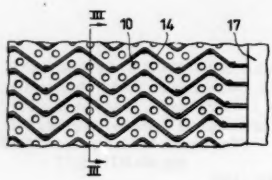
FORMING ROLL FOR TWIN WIRE PAPERMAKING WITH AXIALLY ALIGNED WAVE-SHAPED RIBS

Erik Gunnar Stenberg, Karlstad, and Ernst Ingemar Emanuelsson, Skoghall, both of Sweden, assignors to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

Filed Jan. 11, 1973, Ser. No. 322,690

Int. Cl. D21f *1/00*, *1/60*

U.S. Cl. 162—301 3 Claims



A forming roll for a paper-making machine of the two wire type comprises a cylindrical roll body and a multiplicity of generally corrugated-shaped ribs extending generally radially outwardly from and generally longitudinally along the surface of the cylindrical body. All of the ribs are of substantially identical wave shape along their lengths, and the ribs are substantially equally spaced apart circumferentially of the body. The ribs define a multiplicity of zig-zag, regular wave-like cells of uniform size and shape, each of which cells has a dimension longitudinally of the roll that is substantially greater than its dimension circumferentially of the roll. The medial axes of all of the cells at corresponding points circumferentially of the roll intersect cross-sectional planes of the roll at substantially the same angle such that the wave forms of all cells are substantially in phase longitudinally of the roll.

3,821,077

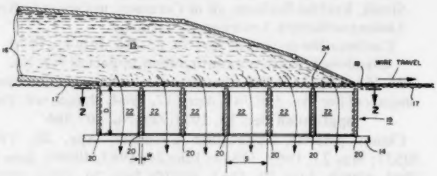
SUPPORT STRUCTURE FOR SUPPORTING A MOVING WEB-FORMING WIRE IN A FORMING ZONE

Richard B. Kaiser, Swarthmore, and Werner A. Schoen, Springfield, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed June 19, 1972, Ser. No. 264,355

Int. Cl. D21f *1/48*

U.S. Cl. 162—351 19 Claims



Disclosed is a support structure for supporting a moving web-forming wire in a forming zone. The structure consists of a plurality of very narrow support bars extending across the width of the forming zone for supporting the wire. The bars are spaced apart to form passageways for drainage of slurry water or other fiber suspending fluid from the web. The bars have a large depth dimension compared to the width and, therefore, are capable of withstanding the drainage resistance and weight forces from the wire without excessive deflection, while also creating little obstacle to drainage flow through the support structure. Lateral reinforcement of the support bars is provided by very thin members extending between bars and having a depth dimension almost equal to the depth dimension of the support bars. The narrowest surfaces of the lateral-reinforcing members face the drainage flow through the support so that the members do not significantly interfere with drainage flow. The unique design of the invention provides a very high percentage of open area for drainage flow, greater than 60 percent of the total structure surface area projected on a plane perpendicular to the direction of drainage flow through the structure, and preferably between 70 and 90 percent. It also provides a support structure with no drainage obstructing member large enough to deleteriously affect uniform formation of the web, the widest member being less than ½ inch, and preferably ⅛ inch or less.

3,821,078

STEAM SEPARATING MEANS FOR BOILING WATER REACTORS

Ragnar Mansson; Lars Nilsson, both of Vasteras; Leif Noberius, Degerfors, and Cnut Sundqvist, Vasteras, all of Sweden, assignors to Aktiebolaget Asea-Atom, Vasteras, Sweden

Filed Sept. 28, 1971, Ser. No. 184,413

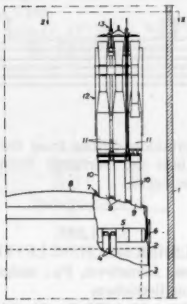
Claims priority, application Sweden, Sept. 28, 1970, 13109/70

Int. Cl. G21c *15/16*

U.S. Cl. 176—54 8 Claims

A boiling water reactor which comprises a reactor tank and a moderator tank located inside the reactor tank has a lid with a plurality of upstanding pipes opening into steam separators. The steam separators are secured together in groups, and each group is clamped to the lid. Each steam separator has a rising tube and each unit has a bell-shaped casing common to the

group and surrounding the steam separators to provide a falling surface for the water separated in the unit. Deflection



caps connected together in groups corresponding to the groups of steam separators are mounted above the open tops of the steam outlet tubes of the separators.

3,821,079

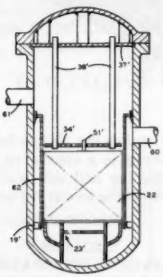
PRESSURIZED WATER NUCLEAR REACTOR WITH UPPER AND LOWER CORE SUPPORT AND POSITIONING MEANS

Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Sept. 9, 1970, Ser. No. 70,747

Int. Cl. G21c *11/00, 13/04, 15/22*

U.S. Cl. 176—61 **7 Claims**



A pressurized water nuclear reactor wherein the core in the lower portion of the reactor pressure vessel is supported from the lower closure of the vessel and the parts in the upper part of the reactor vessel including the control rod guide tubes are supported from the upper part of the vessel. Differential movements between parts supported from the top and bottom of the pressure vessel as caused by thermal changes are guided in a vertical direction and restrained in a transverse direction to maintain axial alignment of the parts.

3,821,080

EXTRACTION OF PROTEINS FROM MICROORGANISM CELLS

Vladimir Kalina, Lausanne, and Pierre Nicholas, La Tour-De-Peilz, both of Switzerland, assignors to Societe D'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Filed June 12, 1972, Ser. No. 262,145

Claims priority, application Switzerland, June 25, 1971, 9318/71

Int. Cl. A23j *1/18*; **C07g** *7/00*

U.S. Cl. 195—5 **22 Claims**

Proteins are extracted from microorganism cells by mechanical rupture under strongly alkaline conditions.

3,821,081

PROCESS FOR PRODUCING 7-AMINO DESACETOXY CEPHALOSPORANIC ACID

Jinnosuke Abe, Tagata; Tetsuo Watanabe, Yokohama; Tsutomu Yamaguchi, Tagata; Kunio Matsumoto, Tagata, and Tadashiro Fujii, Tagata, all of Japan, assignors to Toyo Jozo Company, Ltd., Tagata-gun, Shizuoka, Japan

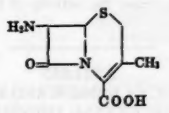
Filed Mar. 15, 1972, Ser. No. 235,085

Claims priority, application Japan, May 31, 1971, 46-38143

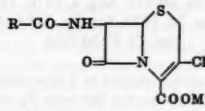
Int. Cl. C12b *1/00*

U.S. Cl. 195—29 **4 Claims**

7-Amino desacetoxy cephalosporanic acid represented by the general formula,



is produced according to a process in which an alkali metal salt of a 7-acylamino desacetoxy cephalosporanic acid represented by the general formula,



wherein R is a benzyl or phenoxymethyl group, and M is an alkali metal atom capable of forming a water-soluble salt, is treated with a carrier containing culture filtrate of an enzyme-producing strain belonging to the genus Bacillus which can decompose the amide bond of the said compound, said strain being *Bacillus megaterium* B–400 FERM-P No. 748, or is treated in an aqueous medium with an enzyme preparation containing said enzyme-producing strain.

3,821,082

TREATING CELLS OF MICROORGANISMS CONTAINING INTRACELLULAR GLUCOSE ISOMERASE

William R. Lamm; Larry G. Davis, and Robert G. Dworschack, all of Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Filed Apr. 7, 1972, Ser. No. 242,142

Int. Cl. C12b *1/00*

U.S. Cl. 195—31 F **9 Claims**

Cells of microorganisms containing intracellular glucose isomerase are treated with a sufficient amount of a salt-containing solution under conditions whereby the glucose isomerase is fixed or stabilized within or on the cells and the cells are contacted with a glucose containing solution to convert a portion of the glucose to fructose.

3,821,083

PREPARATION OF IMMOBILIZED ENZYMES

Ekkerhard Van Leemputten, La Tour-Depeilz, and Marc Horisberger, Mont-Pelerin, both of Switzerland, assignors to Societe D'Assistance Technique Pour Produits Nestle S.A., Lansanne, Switzerland

Filed June 6, 1972, Ser. No. 260,215

Claims priority, application Switzerland, June 21, 1971, 9008/71

Int. Cl. C07g *7/02*

U.S. Cl. 195—63 **10 Claims**

A water-insoluble enzyme product comprises an enzyme bonded to aldehyde groups of a water-insoluble polymer

coated on an inert carrier. Polyacrolein is the preferred polymer, and enzymes include papain and trypsin. Processes for preparing the products are also described.

3,821,084
IMMOBILIZATION OF ENZYMES
Joseph S. Matthews, O'Hara Twp., Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Dec. 19, 1972, Ser. No. 316,450
Int. Cl. C07g 7/02
U.S. Cl. 195—68 12 Claims

Enzymes are immobilized by reaction with an epoxy containing polymer in the presence of an amine such as triethylamine to increase the activity of the immobilized enzyme.

3,821,085
ANTIBIOTIC-GLICOSIDE AND METHOD OF PRODUCING THEREOF
Jury Vasilievich Zhdanovich, Khoroshevskoe shosse, 5, korpus 8, kv. 21; Galina Borisovna Lokshin, Balaklavsky prospekt, 20, korpus 3, kv. 206; Alexandr Dmitrievich Kuzovkov, ulitsa Vinokurova, 5/6, korpus 2, kv. 33; Sarra Markovna Rudaya, ulitsa Nagornaya, 17, korpus 15, kv. 57, and Nadezhda Konstantinovna Solovieva, Odesskaya ulitsa, 18, korpus 2, kv. 151, all of Moscow, U.S.S.R.
Division of Ser. No. 60,917, Aug. 4, 1970. This application Mar. 28, 1973, Ser. No. 345,648
Int. Cl. C12d 9/00
U.S. Cl. 195—80 R 5 Claims

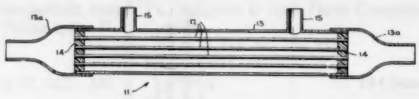
The present invention relates to a new antibiotic-glucoside and to a method of producing the same by culturing Actinomyces olivovariabilis sp. nov. is a nutrient medium. The new antibiotic-glycoside has the empirical formula $C_{52}H_{76}O_{24}$ and comprises aglycone chromomycinone and residues of three desoxy-sugars, two of which are identical to oliose and olivose.

3,821,086
ENZYMATIC PROCESS USING IMMOBILIZED MICROBIAL CELLS
Chin K. Lee, and Margaret E. Long, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed July 9, 1971, Ser. No. 161,337
Int. Cl. C12b 1/00
U.S. Cl. 195—116 16 Claims

Microbial cells having active enzymes associated therewith are subjected to flocculation conditions to produce a flocculated whole cell aggregate that is useful in effecting enzyme-catalyzed chemical transformations. Substrates are brought into contact with the flocculated cell aggregates where they undergo chemical transformations in the presence of active enzymes associated with the cells.

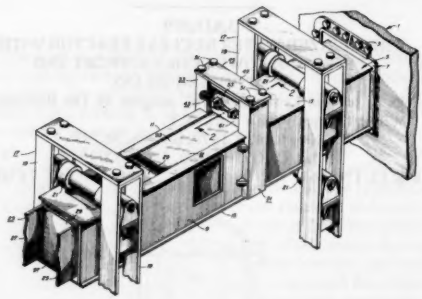
3,821,087
CELL CULTURE ON SEMI-PERMEABLE TUBULAR MEMBRANES
Richard A. Knazek; Peitro M. Gullino, both of Bethesda, Md., and William R. Kidwell, Bethesda, MD, assignors to Robert L. Dedrick, McLean, Va. and The United States of America as represented by the Secretary Department of Health, Education and Welfare, Washington, D.C.
Filed May 18, 1972, Ser. No. 254,678
Int. Cl. C12k 9/00
U.S. Cl. 195—127 6 Claims

The growth of cells in vitro on semi-permeable, tube-shaped membranes or capillaries is disclosed. Cells are initially allowed to settle onto the outer surfaces of the membranes in a nutrient medium environment while the membranes are continuously perfused by oxygenated nutrient medium flowing through the membranes. Nutrient substances diffuse from the perfusing medium through the membrane wall and into the



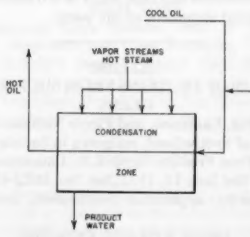
cells, while cell products diffuse from the cell through the membrane wall into the perfusate from which the cell products may be recovered.

3,821,088
COKE OVEN PUSHER MACHINE LEVELER BAR SEAL
William E. Barron, Johnstown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem
Filed Mar. 21, 1973, Ser. No. 343,599
Int. Cl. C10b 37/02
U.S. Cl. 202—269 8 Claims



An apparatus for sealing the air gap between a leveler bar and the leveler opening in a coke oven, including a smoke sleeve and adjustable top and side seals within the smoke sleeve. The seals contact the leveler bar and the smoke sleeve.

3,821,089
DISTILLATION OF SALINE WATER BY DIRECT CONTACT HEAT EXCHANGE WITH IMMISCIBLE LIQUID
Kenneth C. D. Hickman, Rochester, N.Y., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.
Filed Nov. 23, 1971, Ser. No. 201,395
Int. Cl. C02b 1/06
U.S. Cl. 203—10 7 Claims



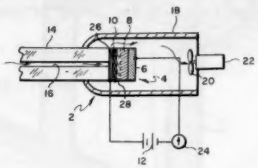
Steam is directly condensed with a cool immiscible oil in admixture with an ambiphyllic agent.

3,821,090

METHOD FOR DIRECTLY MEASURING NO_2 IN AIR

Leo E. Topol, Canoga Park, and Douglas O. Raleigh, Encino, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed June 14, 1973, Ser. No. 370,118
Int. Cl. G01n 27/46
U.S. Cl. 204—1 T 6 Claims



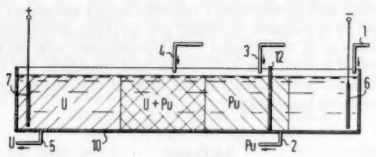
A method of directly measuring concentration of NO_2 in air at the parts -per-million level, said method comprising the steps of forming a solid sensor cell having a silver cathode, a silver iodide electrolyte, and a platinum anode; applying a biasing voltage of 0.05 to 0.25 volt across said sensor cell, passing air to be sensed across the anode of said cell, and measuring the electrical current through said cell.

3,821,091

METHOD OF SEPARATING PLUTONIUM FROM URANIUM AND FROM OTHER TRANSURANIUM ELEMENTS

Abdel-Latif Bilal; Klaus Metscher, and Karl-Erik Zimen, all of Berlin, Germany, assignors to Hahn-Meitner-Institut fur Kernforschung Berlin GmbH, Berlin, Germany

Filed July 25, 1972, Ser. No. 274,900
Claims priority, application Germany, July 28, 1971, 2137769
Int. Cl. C01g 56/00
U.S. Cl. 204—1.5 11 Claims



Plutonium is separated from uranium and other transuranium elements by subjecting an aqueous solution in dilute nitric acid of the elements to be separated to electrolytic extraction by counter-current or cross-current ion migration in the presence of a complexing agent, preferably acetic acid or a mixture of hydrofluoric acid with an alkali metal fluoride, until plutonium and the other elements present accumulate in separate portions of the solution which are thereafter separately withdrawn.

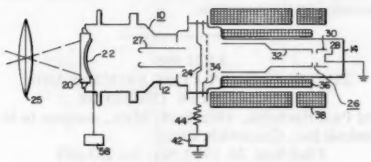
3,821,092

CHARGE STORAGE TARGET AND METHOD OF MANUFACTURE

Wolf D. Frobenius, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 11, 1972, Ser. No. 296,718
Int. Cl. C23b 5/48; H01j 31/26; H01l 15/00
U.S. Cl. 204—15 9 Claims

A charge storage device of the type in which a target electrode provides a plurality of spatially distributed charge storage sites formed on an output side of semiconductor wafer with means associated with the storage sites for sensing and converting the charge on the storage sites into an electrical signal. Input excitation is directed onto the other or input side of the semiconductor wafer and may be in the form of electrons or light capable of generating electron-hole pairs within the semiconductor wafer which diffuse through to the storage sites. The output side of the semiconductor wafer is provided with an apertures insulating layer with a reading electron beam making contact through the apertures in the insulating coating to the spatially distributed storage sites within these apertures. This invention is directed to an improvement in the structure and the process for manufacture thereof wherein pil-



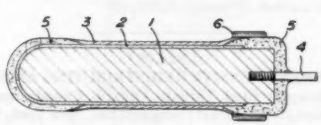
lars of the semiconductive wafer extend from the substrate of the wafer above the insulating layer and a semiconductive region of opposite type conductivity to that of the wafer is provided in the top of the pillar and an electrical conductive contact is provided on the top of said pillar for better electron beam contact to the target. The invention is directed to this structure and the process of fabricating the electrical contact onto the top of the pillar. The process includes the spinning of a resist coating over the pillared surface of the target in such a manner to provide a desired resist pattern for the manufacturing process and thereby avoids other difficult masking process steps.

3,821,093

METHOD OF FABRICATION OF A PROBE FOR A HYGROMETER

Georges Carron; Gaetan Pleyber, and Jean-Louis Violet, all of Grenoble, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed June 16, 1972, Ser. No. 263,461
Int. Cl. C23f 17/00; C23b 3/06; G01r 27/02
U.S. Cl. 204—38 A 17 Claims



The hygrometer probe is fabricated in successive steps which consist in forming a probe body having an aluminum base, in subjecting the probe body to a surface treatment comprising at least one mechanical polishing operation and one electrochemical polishing operation, in carrying out anodic oxidation of the probe body and in subjecting the film-layer of alumina thus formed to a hygrothermal treatment, in depositing a metallic film-layer by vacuum evaporation, and in placing the necessary connections on the probe.

3,821,094
BRIGHT TIN ELECTRODEPOSITING ADDITIVE COMPOSITION

Marcis M. Kampe, Brookline, Mass., assignor to Enthone, Incorporated, New Haven, Conn.

Division of Ser. No. 59,749, July 30, 1970, Pat. No. 3,694,329. This application May 5, 1972, Ser. No. 250,773
Int. Cl. C23b *5/12, 5/46*
U.S. Cl. 204—54 R **14 Claims**

Acid tin baths for electrodepositing bright tin comprising tin ions, free acid, a non-ionic surface active agent and as a brightening agent a substantially linear, low molecular weight, soluble polymeric acrolein or methacrolein. The polymeric acrolein or methacrolein is a homopolymer or copolymer. Additive compositions for acid tin electrodepositing baths are also provided by the invention.

3,821,095
ZINC ELECTROPLATING PROCESS AND ELECTROLYTE THEREFOR

Edward Paul Harbulak, Allen Park, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Filed Sept. 26, 1972, Ser. No. 293,659
Int. Cl. C23b *5/10, 5/12, 5/46*
U.S. Cl. 204—55 R **18 Claims**

This invention relates to a method of producing bright zinc electrodeposits over a wide current density range, free of "-spores" and/or striations, which comprises passing current from an anode to a metal cathode for a time period sufficient to deposit a bright zinc electrodeposit upon said cathode; the current passing through an aqueous bath composition containing at least one zinc compound providing zinc ions for electroplating zinc,

a. at least one bath soluble surfactant selected from the group consisting of bath soluble polyethers, substituted polyethers, and substituted non-aromatic nitrogen heterocyclic surfactants, and
b. at least one aromatic, non-carbonyl containing nitrogen heterocyclic compound.

3,821,096
PROCESS FOR ELECTRODEPOSITING MANGANESE METAL

San-Cheng Lai, Edmond, Okla., assignor to Kerr-McGee Chemical Corp., Oklahoma City, Okla.

Filed Dec. 22, 1972, Ser. No. 317,526
Int. Cl. C22d *1/24*
U.S. Cl. 204—105 M **7 Claims**

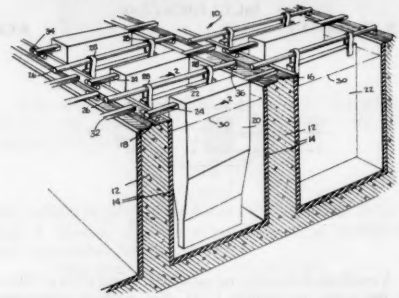
The present invention relates to a process for producing electrolytic manganese metal. Broadly, the invention comprises adding trace amounts of selenium and zinc to the electrolyte of a manganese electrodeposition cell to increase the current efficiency of the cell. It has been discovered that a combination of zinc and selenium acts synergistically to increase the current efficiency of the cell.

3,821,097
CURRENT DENSITY REDISTRIBUTING ANODE

Victor Alexander Ettel, Toronto, Ontario, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Aug. 27, 1971, Ser. No. 175,456
Claims priority, application Canada, Sept. 4, 1970, 092406/70
Int. Cl. C22d *1/14, 1/16;* **B01k** *3/04*
U.S. Cl. 204—106 **14 Claims**

Non-ferrous metals are electrowon from aqueous electrolytes at high current densities, without independent agitation to overcome concentration polarization at the cathode, by the use of special electrolytic cells including insoluble anodes that control the current density at particular levels of the electrolyte so that greater densities can be employed at the upper levels by virtue of the agitation induced by gases evolved at the anode, while at the lower levels smaller current densities are employed to avoid problems associated with concentration polarization. Current density control can be achieved by using a downwardly tapered anode, an anode having smaller working surfaces at its lower extremities or an anode made of special materials having preselected resistivities or by placing a non-conductive multiperforate diaphragm between the lower portions of the anode and cathode. The stirring action of the gases evolved at the anode can be enhanced by incorporating a controlled amount of a surfactant in the electrolyte.



3,821,098
PROCESS FOR THE CURING OF HYDANTOIN CONTAINING ACRYLIC ACID ESTER DERIVATIVES WITH IONISING RAYS

Peter Garth Garratt, Wallisellenzh; Juergen Habermeier, Pfeffingenbl; Daniel Porret, Binningen, and Paul Zuppinger, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

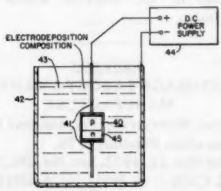
Filed Apr. 5, 1972, Ser. No. 241,387
Claims priority, application Switzerland, Aug. 17, 1971, 12079/71
Int. Cl. C08d *1/00;* **C08f** *1/16*
U.S. Cl. 204—159.22 **16 Claims**

Coatings with commercially valuable surface properties are obtained by application of certain polyacrylates, produced by esterification of oxalkylated N,N-heterocycles with acrylic acid and/or methacrylic acid, on to base materials, the said polyacrylates being applied in the form of thin layers which are cured with ionising rays.

3,821,099
PROCESS FOR PRODUCING ENCAPSULATED SOLID STATE ELECTRONIC DEVICES HAVING A SEALED LEAD- ENCAPSULANT INTERFACE

John R. Szedon, Eighty-four; John A. Jackson, and David C. Phillips, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 19, 1972, Ser. No. 245,416
Int. Cl. B01k *5/02;* **C23b** *13/00*
U.S. Cl. 204—181 **12 Claims**



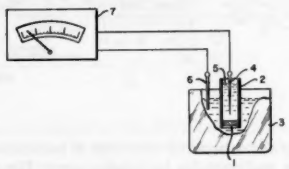
An encapsulated solid state electronic device, such as a semiconductor, with attached metallic connection leads is

made moisture resistant by coating the leads with a smooth, flexible, pinhole free resinous barrier film, which intimately bonds to the leads and encapsulant, providing a void-free lead-encapsulant interface.

3,821,100
COPPER ION SELECTIVE SENSOR

Albert R. Hilton, Richardson, and Isaac Trachtenberg, Dallas, both of Tex., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 23, 1973, Ser. No. 335,397
Int. Cl. G01n *27/36, 27/46*
U.S. Cl. 204—195 G **2 Claims**

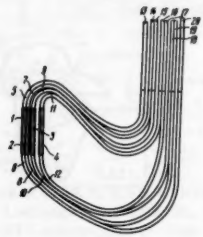


The activity of cupric ions in aqueous solution is determined by means of a sensor comprising a glass having the composition $(R)_x(As_2S_3)_{1-x}$, where R is CuO, CuS, Cu_2S or Cu and x is from about 0.10 to about 0.25.

3,821,101
WIRING SYSTEM OF ELECTROLYZERS FOR PRODUCING ALUMINUM

Vladimir Pavlovich Nikiforov, Moskovsky prospekt, 455, kv. 432; Vasily Ivanovich Nosikov, Moskovsky prospekt, 205, kv. 455; Ilya Genrikhovich Kil, Gavanskaya ulitsa, 37, kv. 61; Igor Kirillovich Tsybukov, Tikhoretsky prospekt, 9, korpus 10, kv. 54; Alexandr Nikolaevich Smorodinov, Bukharestskaya ulitsa, 31, korpus 3, kv. 55; Anatoly Mikhailovich Tsyplakov, prospekt Kima, 30, kv. 74; Nikolai Pavlovich Budkevich, Belgradskaya ulista, 38, korpus 5, kv. 40, and Nikolai Ivanovich Vykhodov, Kirovsky prospekt, 42"b" kv. 7, all of Leningrad, U.S.S.R.

Filed Sept. 8, 1972, Ser. No. 287,363
Int. Cl. C22d *3/02;* **B01k** *3/00*
U.S. Cl. 204—243 R **2 Claims**

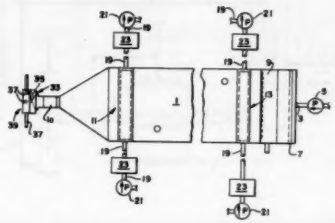


A wiring system of electrolyzers for producing aluminium including cathode bars, each of which is connected to a pair of bars of an anode upright through two packs of flexible aluminium bands, in which case the cross-sectional area of the bar of the anode upright is equal to a half of the cross-sectional area of the cathode bar.

3,821,102
APPARATUS FOR CONDUCTING FLOW ELECTROPHORESIS IN THE SUBSTANTIAL ABSENCE OF GRAVITY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Richard N. Griffin, and Louis R. McCreight, both of Wayne, Pa.

Filed May 31, 1972, Ser. No. 258,171
Int. Cl. B01k *5/00*
U.S. Cl. 204—299 **9 Claims**

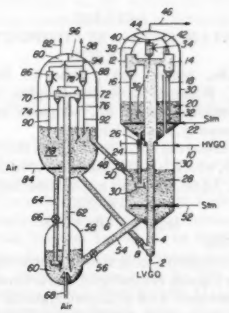


A zero-g, constant-flow electrophoretic separating apparatus comprising a deflecting member to spread carrier fluid across a conduit, separation electrodes spaced apart along the conduit, and an end wall with a valve located in the conduit past the separation electrodes from which layers of carrier and sample may be extracted. Electrode electrolyte is separated from the carrier and continually circulated and cleaned.

3,821,103
CONVERSION OF SULFUR CONTAMINATED HYDROCARBONS

Hartley Owen, Belle Mead, and Edward J. Demmel, Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 30, 1973, Ser. No. 365,304
Int. Cl. B01j *9/04;* **C10g** *11/04*
U.S. Cl. 208—72 **10 Claims**

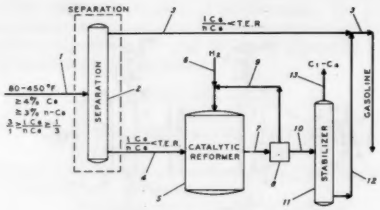


A fluid catalytic cracking catalyst regeneration operation is described which is directed to reducing sulfur in the flue gases. Riser cracking initially with low sulfur feed followed by high sulfur feed in combination with high temperature stripping with regenerated catalyst retains desorbed sulfur compounds in hydrocarbon phase. Separate recovery of regeneration flue gases from a two stage operation reduces flue gas sulfur treating.

3,821,104
PRODUCTION OF HIGH OCTANE GASOLINE

Thomas R. Hughes, Orinda; Robert L. Jacobson, Pinole, and Richard C. Robinson, San Rafael, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 154,521, June 18, 1971, abandoned. This application May 30, 1972, Ser. No. 257,891
Int. Cl. C10g 35/04
U.S. Cl. 208—93 8 Claims



A process for producing a gasoline which includes the following steps:

a. separating a naphtha feedstock which contains iso-C_6 and normal C_6 paraffins into a light fraction containing at least one-half of the total iso-C_6 paraffins and a heavy fraction containing at least 60 percent of the normal C_6 paraffin,
b. catalytically reforming the heavy fraction to obtain reformate, and
c. blending at least a portion of the light fraction with the reformate to obtain gasoline or gasoline blending stock.

The splitting or separating of the naphtha feedstock as per step (a) is preferably carried out by distillation, for example in a deisohexanizer, with the cut point between the light and heavy fractions being at about 150°F. and with the light fraction being rich in iso-C_6 paraffins and the heavy fraction rich in normal C_6 paraffin.

3,821,105
MULTIMETALLIC CATALYST COMPOSITE AND USES THEREOF

Roy T. Mitsche, Island Lake; John C. Hayes, Palatine; Frederick C. Wilhelm, Arlington Heights, and Richard E. Rausch, Mundelein, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

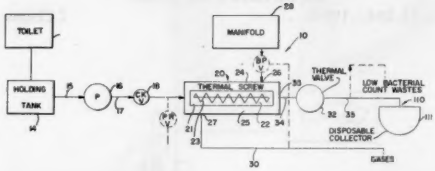
Continuation-in-part of Ser. No. 214,396, Dec. 30, 1971, Pat. No. 3,702,293, which is a division of Ser. No. 34,539, May 4, 1970, Pat. No. 3,660,309. This application Sept. 8, 1972, Ser. No. 287,322
Int. Cl. C10g 35/06
U.S. Cl. 208—139 18 Claims

A catalytic composite, comprising a platinum or palladium component, an iridium component, and a Group IVA metallic component combined with a carrier material containing alumina and a finely divided, zeolitic crystalline aluminosilicate, is disclosed. A specific example of the catalytic composites disclosed herein is a composite containing 0.01 to 2 wt. percent platinum or palladium, 0.01 to 2 wt. percent iridium and 0.01 to 5 wt. percent germanium, tin, or lead combined with a gamma-alumina carrier material having 0.1 to 20 wt. percent of the hydrogen form of mordenite uniformly distributed therethrough. Principal utility of these catalytic composites is, broadly, in processes for the conversion of hydrocarbons and, more particularly, in a process for the production of LPG and a high octane reformate.

3,821,106
WASTE DISPOSAL ASSEMBLY AND PROCESS FOR TREATING SAME

A. Gale Borden, 5 Central Dr., Port Washington, N.Y. 11050

Division of Ser. No. 852,859, Aug. 25, 1969, Pat. No. 3,642,135, which is a continuation-in-part of Ser. No. 724,988, April 29, 1968, abandoned. This application Feb. 21, 1973, Ser. No. 334,473
Int. Cl. B01d 1/14
U.S. Cl. 210—1 1 Claim

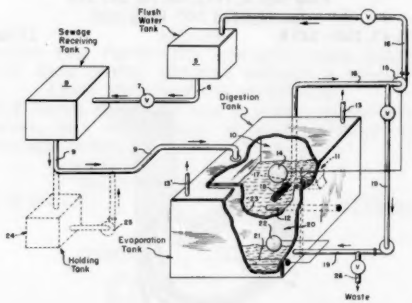


Process for the substantial reduction of bacterial count in sewage waste and assembly for treating same. The assembly comprises means for conveying sewage waste material to a treatment zone, means for retaining the waste material therein, temperature control means to insure that the contents retained in the treatment zone attain a temperature at least that of boiling water and means for passing the treated sewage waste from the treatment zone so that upon discharge of the treated waste material, substantially all of the bacteria have been destroyed.

3,821,107
CLOSED CIRCUIT DOMESTIC SEWAGE TREATING METHOD

Charles Frederick Peoples, 455 Main St., Stoneham, Mass. 02180

Filed June 14, 1972, Ser. No. 262,447
Int. Cl. C02c 1/04
U.S. Cl. 210—12 2 Claims



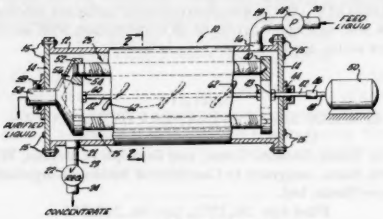
Method and apparatus are described for heating flushed domestic sewage to a liquifying digestion temperature under aeration conditions, withdrawing digestion liquid through a filtering mass of biologically active sewage solids in the digestion zone to form a biologically pure flushing liquid for the sewage in required volume, and removing excess withdrawn digestion liquid to eliminate it from the system.

3,821,108

REVERSE OSMOSIS OR ULTRAFILTRATION MODULE

Serop Manjikian, P.O. 183, Del Mar, Calif. 92014

Filed May 23, 1972, Ser. No. 256,185
Int. Cl. B01d 31/00, 13/00
U.S. Cl. 210—23 13 Claims



A reverse osmosis or ultrafiltration module contains elongated membrane elements which have semipermeable membranes on their outer surfaces, and which are mounted on a frame rotatably mounted inside a pressure resistant container. Feed liquid is supplied to the module at elevated pressure, concentrated liquid is released from the module, and purified liquid is collected from the interiors of the membrane elements. During operation turbulence over the semipermeable membrane surfaces to insure separation efficiency and boundary layer control is achieved by rotating the frame supporting the membrane elements.

3,821,109

METHOD FOR THE CONTROL OF OILS FLOATING ON WATER

Ralph E. Gilchrist, and Jack C. Cox, both of Houston, Tex., assignors to Tenneco Oil Company, Houston, Tex.

Division of Ser. No. 183,620, Sept. 24, 1971, Pat. No. 3,755,189. This application Apr. 19, 1973, Ser. No. 352,529
Int. Cl. C02b 9/02
U.S. Cl. 210—36 6 Claims

The invention includes a method of controlling oil slicks on water by dispersing on the surface of the slick a composition of matter comprising a drying oil and a carrier for said drying oil. The carrier is of the type substantially nontoxic to marine life in the amounts employed and the composition is dispersed in an amount sufficient to confine the oil slick and allow removal thereof.

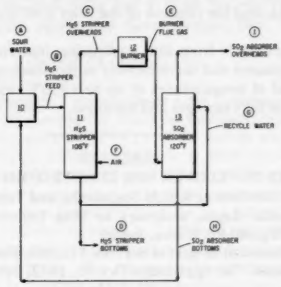
3,821,110

SOUR WATER PURIFICATION PROCESS

Wayne E. Luetzelschwab, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Aug. 11, 1971, Ser. No. 170,940
Int. Cl. C02b 3/08, 3/10
U.S. Cl. 210—63 7 Claims

Sulfidic water containing H_2S and NH_3, or alkali metal or other cations forming water soluble sulfides, is mixed with water containing salts of such cations and possibly excess SO_2, then sent to an H_2S stripper for treatment with air to produce a sulfide-depleted liquid effluent. H_2S evolved from the stripper is burned to form SO_2 which is absorbed in an SO_2 absorber. A portion of the liquid effluent from the H_2S stripper is used as solvent in the SO_2 absorber which forms additional water containing ammonium and possibly excess SO_2 salts for mixing with additional sour water.



SOUR WATER PILOT PLANT

3,821,111

SOLID LUBRICANT

Wataru Abe, Chigasaki; Yasuyuki Terada, Kamakura, and Akira Sugafuji, Fujisawa, all of Japan, assignors to Oiles Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1972, Ser. No. 278,936
Claims priority, application Japan, Aug. 19, 1971, 46-62609
Int. Cl. C10m 7/06, 7/04, 7/02
U.S. Cl. 252—12 7 Claims

This invention is based on a finding in which an addition of 10 — 30 wt percent of alloy powders to the solid lubricant of graphite-sodium fluoride or graphite-sodium fluoride-tungusten disulfide suitable for use at high temperature contributes to improvements of the mechanical strength as well as the friction coefficient, the preferable alloy being that of the composition of 77Cu-23Pb or 90Cu-5Sn-5Pb.

While the addition of 10 – 30 wt percent of a metal salt of tungustate contributes to the formation of strong film or coatings at a high temperature and to prolongation of bearing life.

3,821,112

HEAT-RESISTANT ANTIFRICTION POLYMERIC MATERIAL

Vasily Vladimirovich Korshak, ulitsa Gubkina 4, kv. 81; Kuzma Andrianovich Andrianov, Vystavochny pereulok 3, kv. 9; Irina Alexandrova Gribova, ulitsa Vavilova 12, kv. 31; Alexandr Petrovich Krasnov, prospekt Kalinina 31, kv. 28; Lotary Mikhailovich Khananashvili, Sumskaya ulitsa 6, korpus 2, kv. 244; Tatyana Vsevolodovna Vasilieva, ulitsa Volgina 9, korpus 2, kv. 96, all of Moscow; Georgy Vasilievich Elerdashvili, ulitsa Barnova 137, kv. 66, Tbilisi; Galina Ilinichna Gureeva, ulitsa Molostovykh 11, korpus 5, kv. 18, Moscow; Valery Mikhailovich Kotov, Nagatinskaya Naberezhnaya 34, kv. 260, Moscow, and Rostislav Lazarevich Brontman, Dubninskaya ulitsa 1, kv. 76, Moscow, all of U.S.S.R.

Filed Mar. 20, 1973, Ser. No. 343,166
Claims priority, application U.S.S.R., Mar. 20, 1972, 1761760
Int. Cl. C10m 7/50
U.S. Cl. 252—12.4 5 Claims

A heat-resistant antifriction polymeric material comprising a polymer binder and a filler, wherein the polymer binder is a

product of curing a mixture of polyphenylenephenylsiloxane and phenolphthalein phenol-formaldehyde oligomers taken in a weight ratio of 80-20:20-80, and the filler which is self-lubricating or a mixture thereof with other fillers. The content of the polymer binder in said material is from 7 to 60 percent by weight, and the content of the filler is 93 to 40 percent by weight.

Articles made from said antifriction material feature high heat resistance and serviceability in the absence of a lubricating liquid at temperatures of up to +350°C, exhibiting at the same time high strength and hardness.

3,821,113

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

Hiroichi Morikawa; Keiichi Nagahashi, and Tatsuo Aizawa, all of Osaka, Japan, assignors to Mita Industrial Company, Ltd., Higashi-ku, Osaka, Japan

Continuation-in-part of Ser. No. 115,886, Feb. 16, 1971, abandoned. This application Oct. 16, 1972, Ser. No. 297,712

Int. Cl. G03g *9/04*

U.S. Cl. 252—62.1 **13 Claims**

A liquid developer for electrophotography comprising particles of an image forming material selected from dyestuffs, pigments and powdery metals dispersed in a composite dispersion medium comprising a liquid carrier of high electric resistance and an asphalt extract which is at least substantially completely dissolvable in the liquid carrier and which is obtained by extracting an asphalt with a saturated hydrocarbon liquid, in which the image forming material particles are charged negatively by the dispersion medium, thereby giving a reverse visible image in the case of a negative electrostatic latent image or a non-reverse visible image in the case of a positive electrostatic latent image.

3,821,114

HYDROCARBONOXY-CONTAINING SILICONE FLUIDS USEFUL AS HYDRAULIC FLUIDS

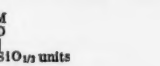
Edgar D. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 24, 1972, Ser. No. 256,483

Int. Cl. C09k *3/00*

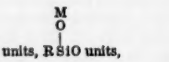
U.S. Cl. 252—78 **6 Claims**

A silicone polymer fluid useful as a brake fluid comprising a polymer or monomer having 0 to 100 mole percent of polymeric or monomeric units selected from $R_2Si(OM)_2$ units,



$R_2SiO_{1/2}$ units

and R_2SiO units, 0 to 100 mole percent of polymeric and monomeric units selected from $RSi(OM)_2$ units,



$RSiO_{1/2}$ units, $RSiO$ units,

and $RSiO_{3/2}$ units, 0 to 10 mole percent of units selected from the class consisting of $(MO)_2SiO_{1/2}$ units, $(MO)_2SiO$ units, $(MO)SiO_{3/2}$ units and SiO_2 units and 0 to 5 mole percent of units selected from $R_3SiO_{1/2}$ units wherein the viscosity of the polymer may vary from 2 to 400 centistokes at 25°C, R is a monovalent hydrocarbon radical, M is selected from alkyl, alkoxy, alkylene, alkoxyalkyleneoxyalkylene and alkyl polyether substituent radicals, wherein the preferred substituent for M is 2-methoxy-2-ethoxy-ethylene or higher and R is preferably methyl.

3,821,115

DETERGENT COMPOSITIONS CONTAINING SALTS OF 4-HYDROXYALKANOIC ACIDS

Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 215,089, Jan. 3, 1972, abandoned. This application Nov. 20, 1972, Ser. No. 308,204

Int. Cl. C11d *1/04*

U.S. Cl. 252—89 **12 Claims**

Low scum-forming detergent compositions are afforded when salts of C_{14} to C_{20} 4-hydroxyalkanoic acids are employed as the sole detergent active or in combination with another surface active agent.

3,821,116

AEROSOL SHAVING LATHER CONTAINING AN OXAZOLINE HOMOPOLYMER

Roy A. White, Somers, Conn., and Rudolph D. Deanin, Westford, Mass., assignors to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Apr. 26, 1972, Ser. No. 247,544

Int. Cl. C11d *17/00*

U.S. Cl. 252—90 **5 Claims**

Aerosol shaving lather incorporating therein a small amount of a water-soluble homopolymer of 4,4-bis(hydroxymethyl)-2-alkenyl-2-oxazoline is disclosed.

3,821,117

EFFERVESCENT TABLET

Jean Breece, North Brunswick, and Michael Brown, Hightstown, both of N.J., assignors to Carter-Wallace, Inc., New York, N.Y.

Filed July 23, 1971, Ser. No. 165,394

Int. Cl. C11d *7/56*

U.S. Cl. 252—99 **14 Claims**

A stable cleansing tablet, for example, for dentures, which dissolves in a favorable time to form a clear, non-foamy, oxygen-effervescent solution and which comprises certain proportions of sodium perborate monohydrate, alkali metal salt of dichloroisocyanurate, benzoic acid or salts thereof, phosphate salts, and chloride salts.

3,821,118

AUTOMATIC DISHWASHING COMPOSITIONS CONTAINING RINSE AGENT

Patricia A. Finck, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 133,338, April 12, 1971, Pat. No. 3,701,735. This application Dec. 3, 1971, Ser. No. 204,752The portion of the term of this patent subsequent to Oct. 31, 1989, has been disclaimed.

Int. Cl. C11d *7/16, 7/14, 7/08*

U.S. Cl. 252—99 **16 Claims**

A cleaning composition particularly adapted for washing dishes, glasses and silverware in mechanical devices such as automatic dishwashers and capable of reducing spotting and filming thereof, and essentially free of halide bleaching compounds, containing as the essential ingredients about 1–20% sucrose, 0.5–10% of an enzyme and 40–95% of at least one water-soluble organic and/or inorganic builder salt.

3,821,119

SILICATED SODA ASH

Ralph E. Temple, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed May 3, 1972, Ser. No. 250,031

Int. Cl. C11d *3/08, 3/10*

U.S. Cl. 252—135 **3 Claims**

A method of preparing a particulate detergent builder includes admixing liquid sodium silicate with anhydrous soda

ash having a particle size of less than 200 microns at a temperature between 21°–51°C., passing the resultant wetted granules through at least an eight mesh screen and rapidly heating the screened material to in excess of 100°C.

3,821,120
PROCESS FOR PROMOTING AN OXIDE FOR USE IN A PYROTECHNIC COMPOSITION
Charles A. Lipscomb, Jr., Crane, Ind., and Treva M. Smith, Hernando, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 21, 1972, Ser. No. 282,508
Int. Cl. C06b *15/00*; C01g *9/02, 49/06*
U.S. Cl. 252—186 5 Claims

A process for increasing the heat of combustion of a metallic oxide to be used in a pyrotechnic composition comprising dissolving in water a metallic sulfate and a doping material which is a lithinum or zirconium compound and then calcining to form a doped metallic oxide.

3,821,121
PREPARATION OF WOOL WAX ALCOHOL PRODUCT OF LOW CHOLESTEROL CONTENT USEFUL AS DISPERSING AND EMULSIFYING AGENT
Percy L. Julian, 515 N.E. Ave., Oak Park, Ill. 60302
Division of Ser. No. 137,028, April 23, 1971, Pat. No. 3,711,611. This application Aug. 2, 1972, Ser. No. 277,240
Int. Cl. B01f *17/38*
U.S. Cl. 252—351 6 Claims

A new and useful dispersing and emulsifying agent derived from wool grease made by separating cholesterol from the unsaponifiables and replacing the cholesterol with β-sitosterol, to form an improved essentially wool wax alcohol product.

3,821,122
BLOCK COPOLYMER COMPOSITIONS HAVING IMPROVED CLOUD POINTS
John J. Walsh, and Carl J. Litteral, both of Marietta, Ohio, assignors to Union Carbide Corporation, New York, N.Y.
Filed Mar. 10, 1972, Ser. No. 233,723
Int. Cl. B01f *17/12, 17/54*
U.S. Cl. 252—353 3 Claims

This application relates to compositions containing a siloxane-polyoxyalkylene block copolymer and an alkali metal salt of an organic sulfonic acid containing from 10 to 35 carbon atoms. The salts markedly increase the cloud points of the block copolymers. The compositions are useful in forming aqueous premixtures that can be employed in producing polyurethane foams. The block copolymer of the compositions functions as a foam stabilizer.

3,821,123
OLEFIN ISOMERIZATION CATALYST
Dalia Germanas, Des Plaines, and Ernest L. Pollitzer, Skokie, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed Feb. 16, 1973, Ser. No. 333,089
Int. Cl. B01j *11/74*
U.S. Cl. 252—439 6 Claims

Double bond isomerization of olefins utilizing a catalyst comprising nickel and sulfur on a porous carrier; the catalyst being prepared by forming an initial composite of the nickel with the carrier material, sulfiding the initial composite to provide a sulfur/nickel atomic ratio of at least about 0.9 in the sulfided composite, and then stripping sufficient sulfur from the sulfided composite with hydrogen to provide a final isomerization catalyst composition having a sulfur/nickel atomic ratio of less than about 0.9 and more than about 0.55.

3,821,124
DETERGENT AND SHAMPOO COMPOSITIONS
Harold Dixon, Isleworth, England, assignor to Beecham Group Limited, Middlesex, England
Continuation-in-part of Ser. No. 493,884, Oct. 7, 1965, abandoned. This application Apr. 1, 1968, Ser. No. 718,005
Claims priority, application Great Britain, Oct. 7, 1964, 40834/64
Int. Cl. C11d *1/02, 3/04*
U.S. Cl. 252—531 5 Claims

Anionic detergent compositions for shampoos and household use are provided of which the essential components are a synergistic combination of an iodate and an amine. The iodate is preferably sodium, potassium or ammonium iodate up to an amount of 5 percent and the detergent is preferably sodium, potassium, ammonium or an alkanolamine sulphated fatty alcohol, a secondary alkyl sulphate or a salt of ethoxylated sulphated alcohol having 1 to 3 ethylene oxide units per mole. The compositions have antimicrobial properties and are virtually self-sterilizing. The metal iodate preferably constitutes 0.25 to 0.5 percent of the composition which in addition to the anionic detergent includes an inert, innocuous carrier adjuvant such as a coloring agent or perfume. The anionic detergent is a non-soap, non-sulphonate compound and its synergistic action with the metal iodate is unrelated to the liberation of iodine.

3,821,125
CRYSTALLINE POLYETHYLENIMINE AND HYDRATE THEREOF
Takeo Saegusa; Hiroyasu Fujii, both of Kyoto, and Hiroharu Ikeda, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan
Filed July 10, 1972, Ser. No. 269,980
Claims priority, application Japan, July 16, 1971, 46-52416
Int. Cl. C08g *33/02*
U.S. Cl. 260—2 EN 8 Claims

Crystalline polyethylenimine or hydrate thereof is prepared by hydrolyzing poly(N-formyl ethylenimine) at a temperature of 20° – 130°C. in the presence of an inorganic base. The crystalline polyethylenimine or its hydrate of this invention is in the state of solid or powder, and is insoluble in water at room temperature but soluble in hot water. This crystalline polyethylenimine and its hydrate may be useful as the water treating agent, paper sizing auxiliary agent, and trapping agents for heavy metals or polar compounds, etc.

3,821,126
PROCESS FOR PRODUCING AMPHOTERIC RESIN
Atsushi Yamamoto, and Shigenori Ohta, both of Tokyo, Japan, assignors to Kyowa Hakko Kagyo Co., Ltd., Tokyo, Japan
Filed June 21, 1972, Ser. No. 264,793
Claims priority, application Japan, June 26, 1971, 46-46042
Int. Cl. C08f *27/08*
U.S. Cl. 260—2.1 R 11 Claims

A process for producing an amphoteric resin which comprises reacting an esterified carboxylic acid type ion exchange resin with a basic amino acid.

3,821,127
ANION EXCHANGE MEMBRANES AND METHOD OF THEIR PRODUCTION
Yukio Mizutani, Tokuyama; Koshi Kusumoto, Shinnanyo, and Yosinori Mizumoto, Kudamutsu, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 20, 1972, Ser. No. 307,852
Claims priority, application Japan, Nov. 26, 1971, 46-94513
Int. Cl. C08j *1/34*
U.S. Cl. 260—2.1 E 5 Claims

A method of making an anion exchange membrane, which comprises sulfonating a membranous polymer having func-

tional groups suitable for introduction of ion exchange groups, under mild conditions first at the surface of the membrane and then gradually towards its interior, thereby to introduce sulfonic acid groups into said functional groups present in the surface, or its vicinitry, or the membrane, and then introducing anoion exchange groups into the remainder of the functional groups to convert said membranous polymer to an anion exchange membrane; wherein said sulfonation is carried out under conditions which will provide a sulfonic acid group equivalent of 0.05 to 20 percent based on the total ion exchange groups, and a ratio of the direct current resistance of the anion exchange membrane to its alternate current resistance of not more than the limiting resistance ratio.

3,821,128

METHOD FOR EXPANDING MICROSPHERES AND EXPANDABLE COMPOSITION

Joseph L. Garner, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 5, 1971, Ser. No. 169,357

Int. Cl. C08f *47/10*

U.S. Cl. 260—2.5 B **10 Claims**

Thermoplastic microspheres are readily expanded to low densities by heating in water in the presence of a variety of salts.

3,821,129

METHOD AND APPARATUS FOR EXTRUSION OF THERMOPLASTICS

David E. Johnson, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 162,555, July 14, 1971. This application Nov. 21, 1972, Ser. No. 308,386

Int. Cl. C08f *47/10*

U.S. Cl. 260—2.5 E **4 Claims**

In a method and apparatus for the extrusion of thermoplastic resinous materials and, in particular, molten thermoplastic resin containing volatile blowing agent in admixture therewith, a seal is provided for an extruder to prevent escape or leakage therefrom of the molten thermoplastic resin-volatile blowing agent mixture.

3,821,130

AIR FROTHED POLYURETHANE FOAMS

Benny Gene Barron, and James Ray Dunlap, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 247,856, April 26, 1972, abandoned. This application May 18, 1973, Ser. No. 361,689

Int. Cl. C08q *22.44*

U.S. Cl. 260—2.5 BD **7 Claims**

Flexible polyurethane foams are prepared from inert gas frothed mixtures of (1) a polyether polyol end-capped with at least 2 moles of ethylene oxide per OH group, (2) an isocyanate containing prepolymer and (3) a catalyst for urethane formation.

3,821,131

BETA-AMINO CARBONYL CATALYSTS FOR POLYURETHANE PREPARATION

David Charles Priest, Charlotte, N.C.; Michael Ray Sandner, Charleston, and David John Trecker, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 27, 1972, Ser. No. 309,906

Int. Cl. C08g *22/38, 22/34*

U.S. Cl. 260—2.5 AC **40 Claims**

Provided as catalysts for the formation of cellular urethane polymers ranging from flexible to rigid foams, are beta-amino carbonyl compounds wherein carbonyl is present as an amido or carboxylic acid ester group and the beta-amino group is present as dialkylamino or an N-morpholino or N,N'-piperazino heterocyclic nucleus. Effective in the catalysis of the water-isocyanate reaction, these beta-amino amides and beta-amino esters are used with particular advantage in the manufacture of water-blown flexible foams, both molded and free-rise, including high-resilience and flame-retarded foam. The beta-amino carbonyl catalysts allow for the formation of foam products essentially free of the odor associated with amines such as N-ethylmorpholine. In view of this highly desirable characteristic and their other beneficial properties, the catalysts of the invention are advantageously employed as direct replacements for N-ethylmorpholine in high-resilience and other foam formulations.

3,821,132

POLYURETHANE FOAMS AND METHOD OF MAKING SAME

Chung-Ling Mao, Sandy Hook; Lynn A. Bakker, Derby, and John R. Robertson, Newtown, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Feb. 28, 1973, Ser. No. 336,842

Int. Cl. C08g *22/08, 22/46*

U.S. Cl. 260—2.5 AM **16 Claims**

High resiliency polyurethane foams are made by the so-called "one-shot" process by reacting a polyalkylene polyether polyol with an organic polyisocyanate and a chain extender which comprises a major amount of a 1,4-dialkanol of an octahydrothieno[3,4-b]pyrazine 6,6-dioxide and a minor amount of a monoalkanol of an octahydrothieno[3,4-b]pyrazine 6,6-dioxide.

3,821,133

ABRASION-RESISTANT VULCANIZATES

Thomas J. Doran, Jr., Norton, and Henry C. Stevens, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 6, 1971, Ser. No. 205,295

Int. Cl. C08d *9/10;* **C08g** *37/16*

U.S. Cl. 260—3 **8 Claims**

Abrasion-resistant vulcanizates are provided comprising a rubber, finely-divided reinforcing siliceous pigment, a compound having a plurality of reactive amino groups, an aromatic hydroxy compound, and a methylene donor. Rubber additives are provided comprising a finely-divided siliceous pigment having adsorbed thereon at least one but not more than two of the group selected from a compound having a plurality of reactive amino groups, an aromatic hydroxy compound, and a methylene donor.

3,821,134

VULCANIZABLE POLYMER BLENDS OF DIENE RUBBERS AND GRAFTED EPDM POLYMERS

Pyong-Nae Son, Akron, and Krishna C. Baranwal, Stow, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Jan. 2, 1973, Ser. No. 320,543

Int. Cl. C08c *9/08;* **C08d** *9/04;* **C08f** *29/12*

U.S. Cl. 260—5 **8 Claims**

Preparation of ethylene-higher α-olefin-polyene (EPDM) polymers having grafted thereon vulcanization accelerators and polymer blends with highly unsaturated diene rubbers that are cured using sulfur are disclosed. The vulcanizates exhibit improved properties compared to polymer blends of EPDM and diene rubbers.

3,821,135

GRANULAR CORK-POLYURETHANE COMPOSITION AND PRODUCTS THEREOF

Robert E. King, Georgetown, Mass., assignor to Cushioned Products Corporation, Boston, Mass.

Continuation of Ser. No. 491,402, Sept. 29, 1965, abandoned, and a continuation of Ser. No. 605,992, Dec. 30, 1966, abandoned, and a continuation of Ser. No. 17,300, March 6, 1970, abandoned. This application Apr. 6, 1972, Ser. No. 241,808

Int. Cl. C08g *51/20*

U.S. Cl. 260—9 **3 Claims**

Cork particles and a polyurethane resin are combined in a new composition. The mixture of cork particles with a liquid resin initially provides a free-flowing material which is easily handled without agglomeration. The mixture, when molded by the application of heat and pressure, produces a light weight, resilient, porous substance having a wide variety of uses such as innersoles for shoes and the like.

3,821,136

WATER ABSORBTIVE POLYURETHANE POLYMERS

Donald Edward Hudgin, Princeton Junction, and Edgar Allan Blair, Princeton, both of N.J., assignors to Princeton Polymer Laboratories, Inc., Plainsboro, N.J.

Filed June 23, 1972, Ser. No. 265,541

Int. Cl. C08g *22/06*

U.S. Cl. 260—9 **11 Claims**

Water absorbtive polyurethane polymers of resins of low equivalent weight and high molecular weight and slightly in excess of equimolar ratios of polyisocyanates or urethane linkage precursors, useful in applications where hydrophilicity or water absorbtion is needed such as for anti-fog coatings; membranes (dialysis or osmosis); swellable fabrics; castable, water-absorbent shapes; castable, machinable and polishable shapes having use as body implants and having water absorbtive properties; etc.

3,821,137

GRAFT COPOLYMERS OF CELLULOSE AND POLYACRYLTHIOAMIDE, METHOD OF THEIR PRODUCTION AND APPLICATION

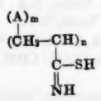
Marina Osipovna Lishevskaya, ulitsa Novatorov, 40, korpus II, kv. 46.; Alexandr Davidovich Virnik, Nagatinskaya ulitsa, 40, korpus 2, both of Moscow; Genrikh Aramaisovich Gabrielian, ulitsa Dispansera 32b, kv. 49, Mytischi Moskovskaya oblast; Zakhar Alexandrovich Rogovih, Donskaya ulitsa, 24, kv. 68., Moscow; Vladimir Fedorovich Borbat, ulitsa 50-letiya Oktyabrskoi revoljutsii, I, kv. 31., Norilsk; Alexandr Mikhailovich Orlov, ulitsa Nansena, 50, kv. 85., Norilsk; Mirriam Borisovna Ferberg, Leninsky prospekt, 28, kv. 181., Norilsk, and Nina Ivanovna Markelova, ulitsa Kirova, 29, kv. 155., Norilsk, all of U.S.S.R.

Division of Ser. No. 48,518, June 22, 1970, Pat. No. 3,728,103. This application Sept. 20, 1972, Ser. No. 290,519

Int. Cl. C08b *23/00;* **C08f** *27/06*

U.S. Cl. 260—17.4 GC **6 Claims**

The present invention relates to new compounds which are graft copolymers of cellulose and polyacrylthiomide with the general formula



wherein

A is cellulose *m* is the degree of polymerization of cellulose ranging from 150 to 2,000

n is the degree of polymerization of polyacrylthioamide ranging from 400 to 4,000; method of producing these new compounds and to application thereof.

The method of producing said compounds resides in treating graft polymers of cellulose and polyacrylonitrile with hydrogen sulphide or with salts of hydrosulphuric acid in an aqueous or an organic medium at a temperature of 60°–100° C and subsequently isolating the target product.

The herein-proposed compounds can find application as electron-exchange complex-forming materials in chemical industry, metallurgy and in other industries.

3,821,138

PIGMENTED POLYMERIC RESIN CASTINGS

Frederick E. Petke, Cincinnati, Ohio, assignor to Borden, Inc., Columbus, Ohio

Filed Dec. 10, 1971, Ser. No. 206,944

Int. Cl. C08f *45/04, 45/14*

U.S. Cl. 260—23 R **6 Claims**

A process for preparing pigmented polymeric resin castings and pigmented polymeric resin castings made thereby. Pigment is added to a normally liquid olefinically unsaturated monomer, with mixing, the rate of addition of pigment being such as to permit wetting out of the pigment in the monomer and the addition being continued until a high shear mass is obtained. The high shear mass is then agitated for a period of time sufficient to permit the essentially complete breaking down of pigment agglomerates and forming of a uniform dispersion of pigment in monomer. The pigment dispersion is cut back with additional monomer to the desired pigment concentration and the mixture, in a suitable container or mold, is subjected to polymerization conditions. Polymeric resin castings made from the pigment-monomer dispersions are characterized by high gloss, the absence of internal flaws, and retention of physical properties.

3,821,139

ELECTRICAL CABLE HAVING AN OUTER SHEATH WITH IMPROVED PYROLYSIS PROPERTIES

Dominic Anthony Alia, Oakland, N.J., assignor to The Okonite Company, Ramsey, N.J.

Filed Dec. 20, 1972, Ser. No. 316,848

Int. Cl. C08f *29/12*

U.S. Cl. 260—23 H **2 Claims**

An electrical cable jacket employs chloro-sulfonated polyethylene and chlorinated polyethylene elastomeric polymers, magnesium oxide, and extenders and vulcanizing constituents.

The jacket composition will not sustain combustion and, moreover, does not emit substantial smoke products during pyrolysis.

3,821,140

ORGANOPOLYSILOXANE COMPOSITIONS

Gerard Milbert, Ecully, France, assignor to Rhone-Poulence S.A., Paris, France

Filed Jan. 5, 1973, Ser. No. 321,307

Claims priority, application France, Jan. 7, 1972, 72.00504; Oct. 23, 1972, 72.37511

Int. Cl. C08g *51/72*

U.S. Cl. 260—18 S **18 Claims**

A polysiloxane composition curable to a fire resistant elastomer comprises (a) an organopolysiloxane rubber with blocked ends, at least 50 percent of the organic radicals being methyl, (b) an inorganic filler, organic peroxide, and per 100 parts rubber 0.001–0.01 parts of an additive comprising platinum, 3–35 parts of rare earth metal oxide, or 1 – 8 parts of rare earth metal hydroxide, the latter optionally with up to 5 parts of magnesium oxide.

3,821,141

FLAME RETARDANT POLYOLEFIN COMPOSITION OF IMPROVED COLOR AND MELT STABILITY

Ronald D. Mathis, Taylors, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 17, 1972, Ser. No. 244,894

Int. Cl. C08f *45/58, 45/62*

U.S. Cl. 260—23 H **14 Claims**

Flame retardant polyolefin compositions having improved color and melt stability are obtained by the addition of a phenolic stabilizer and a metal soap mixture to said compositions.

3,821,142

DYEABLE POLYOLEFINS

James S. Dix, Greenville; Ronald D. Mathis, Mauldin, both of S.C., and John H. Underwood, Charlotte, N.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 160,135, July 6, 1971, abandoned. This application May 2, 1973, Ser. No. 356,533

Int. Cl. C08f *19/14*

U.S. Cl. 260—23 H **10 Claims**

The dyeability of polyolefins is enhanced by incorporating therein calcium stearate and nickel bis(O-ethyl-3,5-di-t-buty-4-hydroxybenzylphosphonate).

3,821,143

HOT MELT ADHESIVE COMPOSITION CONTAINING A BRANCHED ELASTOMERIC COPOLYMER

Edward Fuller Cluff, and Austin Matthew Snow, Jr., both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 22, 1973, Ser. No. 343,683

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 B **9 Claims**

A hot melt adhesive composition comprising, in parts by weight, about:

a. 100 parts of petroleum wax,

b. 40 to 200 parts of a tackifying resin, and

c. 15 to 100 parts of a branched elastomeric copolymer of ethylene, at least one C_3 to C_{18} alpha-olefin, at least one direactive nonconjugated diene, and optionally at least one mono-reactive nonconjugated diene; said copolymer having a Mooney viscosity of about 10 to 70.

3,821,144

ASPHALTIC COMPOSITIONS

Andre Goyer, Lillebonne, and Rene Smadja, Notre Dame de Gravenchon, both of France, assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 30, 1973, Ser. No. 346,515

Claims priority, application France, May 12, 1972, 72.17034

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 AS **6 Claims**

Asphaltic compositions, having improved elastic properties, are provided comprising a major amount of asphalt, a minor amount of a copolymer of ethylene and vinyl acetate and a minor amount of a synthetic terpenic resin.

3,821,145

AQUEOUS COATING COMPOSITION OF AN ACRYLIC GRAFT COPOLYMER, A LINEAR ACRYLIC POLYMER AND A CROSS-LINKING AGENT

Aloysius N. Walus, Flint, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1972, Ser. No. 317,376

Int. Cl. C08g *37/30;* **C08f** *37/06;* **C08g** *51/24*

U.S. Cl. 260—29.4 UA **13 Claims**

The aqueous coating composition contains 2–50 percent of a film-forming binder in an aqueous medium and the binder comprises the following components:

1. an acrylic polymer which comprises a graft copolymer having the general structure A—B where A is the backbone segment and B is the graft segment; the acrylic polymer is formed by polymerizing the following monomer units to form the backbone segment A methylmethacrylate, an alkyl methacrylate or an alkylacrylate, a hydroxalkylacrylate or methacrylate, a polymerizable carboxylic acid such as acrylic acid or methacrylic acid, and a grafting site monomer such as allymethacrylate to which a side chain segment B is grafted of acrylamide or methacrylamide and optionally a hydroxyalkylacrylate or a hydroxyalkylmethacrylate;
2. a linear acrylic polymer of methyl methacrylate, an alkyl acrylate or an alkyl methacryate, a hydroxyalkyl acrylate or a hydroxyalkyl methacrylate, and an ethylenically unsaturated carboxylic acid which is 75–100 percent neutralized with ammonia or an amine; and
3. a water-dispersible cross-linking resin such as hexakis(methoxymethyl) melamine;

the novel coating composition forms a high quality finish for automobile and truck bodies and also can be utilized for appliances such as refrigerators and stoves and for cabinets and the like.

3,821,146

STABLE COLLOIDAL SYNTHETIC RESIN BINDER COMPOSITIONS

Arthur H. Drelich, Plainfield, and Bobby B. Bowman, East Brunswick, both of N.J., assignors to Johnson & Johnson, Middlesex, N.J.

Continuation-in-part of Ser. No. 109,026, Jan. 22, 1971, Pat. No. 3,706,595. This application Aug. 30, 1971, Ser. No. 176,306

Int. Cl. C08f *29/56;* **D21d** *3/00*

U.S. Cl. 260—29.6 MM **14 Claims**

Methods of controlling the migration of resin binders in the manufacture of bonded nonwoven fabrics from fibrous webs comprising the use of a resin binder composition comprising: (1) a synthetic resin; (2) a water soluble, polymeric, carboxylic thickener; and (3) a metal amine, complex coordination compound capable of releasing ions of said metal to control the total migration of the resin binder during its deposition on the fibrous web.

3,821,147

COMPOSITION FOR IMPARTING NON-PERMANENT SOIL-RELEASE CHARACTERISTICS COMPRISING AN AQUEOUS SOLUTION OF POLYCARBOXYLATE COPOLYMER AND WATER-SOLUBLE AMINE

Robert E. Dickson, Belle Mead, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 24, 1972, Ser. No. 237,916

Int. Cl. D06m *15/26;* **C08f** *3/42, 15/36*

U.S. Cl. 260—29.6 N **8 Claims**

A composition for applying non-permanent soil-release finish to fabrics from dilute solution comprising a polycarboxylate polymer having an acid equivalent weight of from about 110 to 175, and a water-soluble amine. A preferred polycarboxylate polymer is a copolymer of ⅔ methacrylic acid/⅓ ethylacrylate. The composition is particularly useful for applying a soil-release finish in the rinse cycle of a home laundry process.

3,821,148

PLASTICIZED THERMOPLASTIC BLOCK COPOLYMERS

Henry S. Makowski, Scotch Plains, and Robert D. Lundberg, Somerville, both of N.J., assignors to Esso Research and Engineering Company

Filed Sept. 28, 1973, Ser. No. 401,626
Int. Cl. C08f *45/50, 45/38, 45/28*
U.S. Cl. 260—30.6 R **27 Claims**

Novel plasticized thermoplastic copolymers are described wherein said copolymer is selected from the group consisting of block copolymers having the general formulae (I)A—B—A, (II)A—B—A—B—A and (III) $xB-[A-B]n-yA$, and graft copolymers having the general formula (IV)

wherein *m* and *n* are integers greater than or equal to 2; *x* and *y* are 0 or 1, and *y* is 0 when *n* is 2; and A and B are mutually incompatible thermoplastic polymer blocks having a solubility parameter difference of greater than 0.7, preferably greater than 1.0, and said plasticizer is selected from the group consisting of plasticizers having a solubility parameter within 1.2 units of the solubility parameter of said B polymer block. Preferably, the A and B polymer blocks have a molecular weight of at least 5000 and a glass transition temperature of at least 35°C., and in general from 25 to 300 parts plasticizer is added per hundred parts of the copolymers described above to prepare the novel compositions claimed herein. The preferred class of copolymers are prepared from vinyl aromatics. In the most preferred embodiment the copolymer is a styrene-t-butyl styrene-styrene copolymer and the plasticizer is an oil having a low aromatics content, for example an oil of about 1–2 percent aromatic content, 10–13 percent paraffinic content and 82–88 percent naphthenic content is preferred. These oils in this general range are widely available as commercial products and generally have a viscosity at 68°F. of about 1100 SSU (Saybolt), and a specific gravity of about 0.88.

3,821,149

PLASTICIZED THERMOPLASTIC SEMICRYSTALLINE BLOCK COPOLYMERS

Henry S. Makowski, Scotch Plains, and Robert D. Lundberg, Somerville, both of N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed Sept. 28, 1973, Ser. No. 401,627
Int. Cl. C08f *45/50, 45/38, 45/28*
U.S. Cl. 260—30.6 R **25 Claims**

Novel plasticized thermoplastic copolymers are described wherein said copolymer is selected from the group consisting of block copolymers having the general formulae,

I. A-B-A
II. A-B-A-B-A
III. xB-[A-B]n-yA, and graft copolymers having the general formula

wherein m and n are integers greater than 1; *x* and *y* and 0 or 1, and *y* is 0 when *n* is 2; and A and B are mutually incompatible thermoplastic polymer blocks, wherein the A block is a crystalline phase or semicrystalline phase having a crystalline content of at least 25 percent and the B block is a substantially non-crystalline plastic, and said plasticizer is selected from the group consisting of plasticizers having a solubility parameter within 1.2 of the solubility parameter of said B polymer block. Preferably the A polymer block has a crystalline melting point of at least 35°C. and a molecular weight of at least 5,000 while the B polymer block is preferably prepared from vinyl aromatics and has a molecular weight of at least 5,000 and a glass transition of at least 35°C. In general from 25 to 300 parts per hundred plasticizer is added to the copolymers described above to prepare the novel compositions claimed herein.

In the most preferred embodiment the copolymers are: polyethylene-polystyrene-polyethylene, where the plasticizer is a non-volatile phthalate ester such as dibutyl phthalate or polyethylene-poly-t-butyl styrene-polyethylene where the plasticizer is an oil having a low aromatics content, for example, an oil of about 1–2 percent aromatic content, 10–13 percent paraffin content, and 82–88 percent naphthenic content.

3,821,150

METHOD FOR IMPROVING THE SURFACE OF THERMOSET COATINGS

William D. Blackley, Afton, and Leslie G. Berntson, Richfield, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 2, 1973, Ser. No. 329,219
Int. Cl. C08g *51/36*
U.S. Cl. 260—31.6 **16 Claims**

Method for improving the leveling properties of thermosetting coating powders which comprises including in the powder composition solid, finely divided glyceryl tris(12-hydroxystearate).

3,821,151

SMOKE RETARDANT COMPOSITIONS

Lawrence C. Mitchell, Mt. Vernon, Ind., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 196,801, Nov. 8, 1971. This application Apr. 30, 1973, Ser. No. 355,651
Int. Cl. C08f *45/40, 45/56*
U.S. Cl. 260—31.8 R **4 Claims**

Iron powder admixed with a copper and/or a molybdenum compound imparts smoke retardant properties to combustible materials such as plastics. Thus, for example, polyvinyl chloride does not emit as much smoke during combustion when it is compounded with cast iron powder admixed with a copper oxide and/or a molybdenum oxide.

3,821,152

HEAT RESISTANT VULCANIZABLE BLEND OF BUTADIENE/STYRENE RUBBERS AND ETHYLENE-PROPYLENE-DIENE TERPOLYMERS

William H. Cornell, Stow, and Roy W. Siedenstrang, Akron, both of Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 19, 1973, Ser. No. 324,974
Int. Cl. C08c *11/18, 11/22;* **C08d** *9/08*
U.S. Cl. 260—33.6 AQ **11 Claims**

A sulfur vulcanizable blend having improved properties is obtained by blending from 40 to 60 parts by weight of a solution polymerized copolymer of butadiene and styrene, from 10 to 55 parts by weight of an emulsion polymerized copolymer of butadiene and styrene, from 25 to 45 parts by weight of a termpolymer of ethylene, propylene and a diene comonomer, from 40 to 70 parts by weight of an extender oil per 100 parts by weight of total polymer, and from 120 to 200 parts by weight of carbon black per 100 parts by weight of total polymer.

3,821,153

POLYACETYLENE TERPOLYMERS AND PLASTICIZED POLYACETYLENE BLENDS

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 118,467, Feb. 24, 1971, abandoned. This application Jan. 29, 1973, Ser. No. 327,427

Int. Cl. C08f *45/28, 19/20;* **C01b** *31/07*

U.S. Cl. 260—33.6 UA **7 Claims**

Certain polyacetylene terpolymers are provided having chemically combined ether linkages, or alkylene linkages and mixtures thereof, exhibiting improved compatability with various organic plasticizers. Blends of polyacetylene, including the polyacetylene terpolymers, and certain substantially nonvolatile aliphatically unsaturated plasticizers, such as 1,4-diphenylbutadiyne, have been found to be melt extrudable, and convertible to carbonaceous films and molded carbon objects.

3,821,154

ORGANOSILICON COMPOSITIONS FOR THE NON-STICK TREATMENT OF SHEETS AND FILMS

Jean Dumoulin, and Louis Linguenheld, both of Rhone, France, assignors to Rhone-Poulence S.A., Paris, France

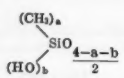
Filed Apr. 13, 1973, Ser. No. 350,760

Claims priority, application France, Apr. 14, 1972, 72.13250

Int. Cl. C08g *51/28*

U.S. Cl. 260—33.6 SB **11 Claims**

Coating compositions containing specified quantities of (a) an α, ω-dihydroxydimethylpolysiloxane polymer, with a viscosity of at least 25,000 cPo at 25°C, containing at most 0.1 percent by weight of hydroxyl groups, (b) a dimethylpolysiloxane rubber terminated at each end of its chain by a unit of the formula $(CH_3)_3SiO_{0.5}$ or $(CH_2{=})_2CH_2{=}CHSiO_{0.5}$, with a viscosity of at least 1 million cPo at 25°C, (c) a crosslinking agent of the general formula $(Q)_{4-n}Si[(OCH_2CH_2)_pOQ']_n$ in which the symbol Q represents a hydrolysable radical selected from the group consisting of N,N-dialkylaminoxy, ketoniminoxy and aldiminoxy radicals, the symbol Q′ represents a methyl or ethyl radical, the symbol n represents a number from 1 to 4 and the symbol p represents 1 or 2, (d) a tin, titanium or iron catalyst, (e) optionally a specified silicon containing vulcanisation accelerator and (f) an organic solvent are rendered more storage stable by incorporation of a hydroxylic methylpolysiloxane oil containing at least 3 percent by weight of hydroxyl groups, of viscosity between 3 and 400 cPo at 25°C, of the average general formula



in which the symbol a represents a number from 1.7 to 2.3 and the symbol b represents a number from 0.14 to 1.

The compositions can be applied to sheets or films of various materials to render the surface non-stick when in contact with tacky substances.

3,821,155

FIRE RETARDANT MULTICOLORED COATING COMPOSITION

Albert Kloos, Colonia, N.J., assignor to Celanese Coatings & Specialties Company, New York, N.Y.

Filed Dec. 22, 1970, Ser. No. 100,788

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 EP **4 Claims**

Fire retardant multicolored coating compositions, useful on ship decks, industrial floors and the like, are made from multicolored coated sand and a clear binder wherein the colored coating on the sand contains antimony trioxide and pigment containing organically bound halogen.

3,821,156

POLYETHYLENE TEREPHTHALATE FILM

Grover L. Farrar, Greenville, S.C., assignor to Celanese Corporation, New York, N.Y.

Filed Jan. 3, 1972, Ser. No. 215,141

Int. Cl. C08g *51/04*

U.S. Cl. 260—40 R **6 Claims**

A polyethylene terephthalate film having improved abrasion resistance and the method for producing the film. The film is characterized by the inclusion of dispersed particles of an inert additive and calcium carbonate.

3,821,157

THERMOPLASTIC BINDERS FOR CONTINUOUSLY PRODUCED LEADS FOR PENCILS, COPYING PENCILS AND COLOURED PENCILS

Karl-Heinz Muller, Leverkusen; Harry Rohr, Cologne, and Karl-Heinz Ott, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 147,648, May 27, 1971, which is a continuation of Ser. No. 755,779, Aug. 28, 1968, abandoned. This application May 17, 1973, Ser. No. 361,186

Claims priority, application Germany, Oct. 4, 1967, 53672

Int. Cl. C08f *45/06, 45/08*

U.S. Cl. 260—42.47 **4 Claims**

Leads for writing purposes comprising a graft polymer of an ethylene/vinyl acetate copolymer, a vinyl chloride and a graft copolymer of a styrene and an acrylonitrile type monomer onto a butadiene polymer and graphite or a scouring agent.

3,821,158

POLYMER COMPOSITION

Peter Henry Westermann, Dorking, and Sidney George Fogg, Ashstead, both of England, assignors to BP Chemicals International Limited, London, England

Continuation-in-part of Ser. No. 164,419, July 20, 1971, abandoned. This application Oct. 25, 1972, Ser. No. 300,744

Int. Cl. C08d *9/08;* **C08f** *29/04, 29/08*

U.S. Cl. 260—42.18 **12 Claims**

Thermosetting moulding compositions comprising at least 50 percent of an inorganic filler, a high vinyl butadiene polymer, a free radical initiator and polyethylene in an amount less than 100 percent of the polymerisable material as shrink controller are described. The high vinyl butadiene polymer preferably contains 65 percent of 1,2-bonded units (i.e., units containing pendant vinyl groups) and can be used in conjunction with copolymerisable monomers. The polyethylene can be a homo- or copolymer and preferably has a density in the range 0.915 to 0.96. Low density or a mixture of low and high density polyethylene are particularly preferred. The compositions have low shrinkage on thermosetting and have good tensile strength in the thermoset state.

3,821,159

FIRE RETARDANT POLYMER CONTAINING OCTACHLOROCYCLOPENTENE

Syed K. Mowdood, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 2, 1971, Ser. No. 204,359

Int. Cl. C09k *3/28*

U.S. Cl. 260—45.7 R **3 Claims**

The transparency, gloss and resistance to burning of polymers is improved when the polymer contains octachlorocyclopentene (OCCP).

3,821,160
STRESS-CRACK RESISTANT POLYHYDROXY-ETHER POLYMERS
Kurt F. Wissbrun, Short Hills, N.J., assignor to Celanese Corporation, New York, N.Y.
Filed Jan. 26, 1973, Ser. No. 327,049
Int. Cl. C08d 11/04
U.S. Cl. 260—45.7 S 9 Claims
Polyhydroxy-ethers having improved stress-crack resistance properties are prepared by dissolving in the polymer a soluble inorganic salt.

3,821,161
AROMATIC DIIMIDES OF 3,5-DIALKYL-4-HYDROXYPHENYLSUBSTITUTED AMINES
John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Division of Ser. No. 186,463, Oct. 4, 1971, Pat. No. 3,746,721. This application Jan. 18, 1973, Ser. No. 324,629
Int. Cl. C08f 45/58
U.S. Cl. 260—45.8 N 7 Claims
Aromatic diimides of 3,5-dialkyl-4-hydroxyphenylsubstituted amines of this invention effectively stabilize organic polymeric materials against the effects of heat and oxygen. The diimides of this invention are prepared by reacting the appropriate 3,5-dialkyl-4-hydroxyphenylsubstituted amine with an aromatic dianhydride or aromatic diimide. An example of this class of stabilizer is N,N'-bis(3,5-di-t-butyl-4-hydroxybenzyl)diphenyl sulfone-3,4,3',4'-tetracarboxylic acid diimide.

3,821,162
BENZOPHENONE-3,4,3,4-TETRACARBOXYLIC ACID DIIMIDES OF 3,5-DIALKYL-4-HYDROXYPHENYLSUBSTITUTED AMINES
Martin Dexter, Briarcliff Manor, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Division of Ser. No. 186,560, Oct. 4, 1971, Pat. No. 3,734,926. Filed Jan. 17, 1973, Ser. No. 324,477
Int. Cl. C08f 45/58
U.S. Cl. 260—45.8 N 3 Claims
Benzophenonetetracarboxylic acid diimides of 3,5-dialkyl-4-hydroxyphenylsubstituted amines of this invention effectively stabilize organic materials against the effects of heat and oxygen. The diimides of this invention are prepared by reacting the appropriate 3,5-dialkyl-4-hydroxyphenylsubstituted amine with benzophenone-3,4,3',4'-tetracarboxylic acid dianhydride or diimide. An example of this class of stabilizers in N,N'-bis(3,5-di-t-butyl-4-hydroxybenzyl)3,4,3',4'-tetracarboxylic acid-diimide.

3,821,163
METAL COMPLEXES OF N,N'-DIALKYLESTERS OF ETHYLENEDINITRILO-TETRAACETIC ACID: STABILIZERS FOR POLYMERS
John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Greenburgh, N.Y.
Continuation-in-part of Ser. No. 176,307, Aug. 30, 1971, Pat. No. 3,751,440. This application Aug. 6, 1973, Ser. No. 385,790
Int. Cl. C08f 45/62; C08g 45/62
U.S. Cl. 260—45.75 R 10 Claims
Synthetic polymeric compositions which are subject to ultraviolet light deterioration are stabilized by means of an effective amount of a metal complex of N,N'alkyl esters of ethylenedinitrilotetraacetic acid. Polymeric compositions containing these stabilizers also exhibit an increase in susceptibility to dye as compared to the unstabilized polymeric compositions. A typical embodiment is the nickel complex, N,N'-di-n-octadecyl ester of ethylenedinitrilotetraacetic acid.

3,821,164
FILM FORMING CHLORINATED POLYIMIDE-ETHERS AND METHOD FOR MAKING SAME
Howard M. Relles, Rexford, and Robert W. Schluenz, Latham, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Feb. 16, 1972, Ser. No. 226,978
Int. Cl. C08g 20/32
U.S. Cl. 260—47 CZ 29 Claims
Film forming flame resistant chlorinated polyimide ethers are provided, and a method for making them. Reaction can be effected between a dihydric phenol and dichloromaleimide or tetrachlorobismaleimide in the presence of base. Self-condensation of dichloroimidophenols also provide valuable flame resistant polymers.

3,821,165
NEW THERMOSETTING MIXTURES OF POLYISOCYANATES, WEAKLY BRANCHED POLYESTERS AND POLYOLES
Friedrich Lohse, Oberwil Basel-Land; Rolf Schmid, Reinach Basel-Land, and Hans Batzer, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed May 24, 1972, Ser. No. 256,527
Claims priority, application Switzerland, June 3, 1971, 8116/71
Int. Cl. C08g 22/12, 22/24, 22/44
U.S. Cl. 260—47 CB 9 Claims
Heat-curable plasticised mixtures for the manufacture of moulding materials based on polyurethanes, containing (a) a polyisocyanate, (b) a slightly branched polyester possessing terminal hydroxyl groups and (c) a defined aromatic polycarboxylic acid hydroxyester containing at least one secondary hydroxyl group (for example a hydroxyester manufactured by reacting 1 mol of trimellitic anhydride and 1 mol of 1,2-propanediol in a first stage, and further reaction with 2 mols of cresylglycid), with the mixture containing, per 1 equivalent of isocyanate group, 0.05 to 0.3 hydroxyl equivalents of the polyester (b) and 0.3 to 1.0 hydroxyl equivalents of the aromatic polycarboxylic acid hydroxyester (c). The mouldings obtained by hot curing of the moulding compositions are flexible, tough and impact-resistant, and these mechanical properties are largely independent of temperature; a transition to the soft rubbery-elastic state only occurs above 150°C.

3,821,166
POLYMERCAPTAN EPOXY RESIN HARDENER
Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 68,770, Sept. 1, 1970, Pat. No. 3,742,006. This application Mar. 12, 1973, Ser. No. 340,356
Int. Cl. C08g 30/14
U.S. Cl. 260—47 EN 4 Claims
A polymercaptan epoxy resin hardener composition and a process for curing epoxy resins through the use of said composition wherein the curing process yields an epoxy adhesive possessing excellent high temperature stability.

3,821,167
PHOTO-SENSITIVE POLYMERS, PROCESS FOR PRODUCING SAME AND COMPOSITIONS CONTAINING SAID POLYMERS
Takateru Asano, Tokyo, Japan, assignor to Fuji Chemicals Industrial Co., Ltd., Tokyo, Japan
Filed May 10, 1971, Ser. No. 141,949
Claims priority, application Japan, May 15, 1970, 45-41159
Int. Cl. C08g 17/14
U.S. Cl. 260—49 13 Claims
The present invention relates to photo-sensitive polymers and compositions thereof which become insoluble on expo-

sure to light and can be developed with an aqueous alkaline solution. These photo-sensitive polymers are obtained by reacting polyvinylalcohol with (1) aromatic aldehydes, carboxylic acids or sulfonic acids having light-sensitive groups, and (2) aromatic aldehydes, carboxylic acids or sulfonic acids having phenolic hydroxyl groups. These photo-sensitive compositions according to this invention have a large range of applications such as photomechanical processes and photofabrications, etc.

3,821,168

PROCESS FOR THE PREPARATION OF LINEAR POLYAMIDES CONTAINING SULFONATE GROUPS

Gunter Keil, Lorsbach, Taunus, Germany, assignor to Farbeverke Hoechst Aktiengesellschaft vormals Meister Lucuis & Bruning, Frankfurt Main, Germany

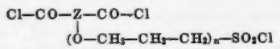
Filed May 4, 1972, Ser. No. 250,375

Claims priority, application Germany, May 6, 1971, 2122368

Int. Cl. C08g *20/20*

U.S. Cl. 260—49 **4 Claims**

The invention relates to filaments, fibers and sheets from linear polyamides containing sulfonate groups as well as to a process for the preparation of these polyamides from aromatic dicarboxylic acid dichlorides and aromatic diamines which may contain small amounts of aliphatic, cyclo-aliphatic dicarboxylic acid dichlorides or mixtures of aliphatic and cycloaliphatic dicarboxylic acid dichlorides and diamines, using 2 to 15 mole percent, referred to the total amount of the dicarboxylic acid dihalides, of at least one dicarboxysulfonic acid trichloride of the general formula



wherein Z represents a trivalent aromatic radical and n represents one of the numbers 0 and 1, by means of polycondensation in solution and subsequent treatment with bases.

The structure formed from these polyamides are distinguished by a high affinity for cationic dyestuffs.

3,821,169

CATIONICALLY DYEABLE POLYESTERS WITH HYDROXYALKYLATED ISETHIONIC ACID

James E. Duddey, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 17, 1972, Ser. No. 281,598

Int. Cl. C08g *17/18*

U.S. Cl. 260—77 **3 Claims**

There is disclosed a method for preparing cationically dyeable highly polymeric linear polyester and copolyester resins which comprises adding to a multi-step polyester or copolyester forming process at least one compound selected from the group consisting of hydroxyalkylene oxide and hydroxypoly(alkylene oxide) derivatives of metallic salts of isethionic acid.

3,821,170

ELECTRICAL CONDUCTIVE HEATING OF POLYAMIDE-FORMING CONDENSATION POLYMERS

Victor F. Hanson, Yorklyn, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 10, 1972, Ser. No. 242,641

Int. Cl. C08g *20/24*

U.S. Cl. 260—78 R **2 Claims**

A polymerization process for nylon includes the step of heating an aqueous nylon salt mixture by passing an electrical current through the mixture to generate heat. The electrical resistance of the mixture increases as water boils off and the salt polymerizes.

3,821,171

CONTINUOUS, SOLID-PHASE POLYMERIZATION OF POLYAMIDE GRANULES

Daniel Harper Beaton, Parkersburg, W. Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 158,900, July 1, 1971, abandoned. This application June 9, 1972, Ser. No. 261,212

Int. Cl. C08g *20/38*

U.S. Cl. 260—78 SC **10 Claims**

A solid-phase polymerization process for preparing polyamide granules of increased molecular weight by heating the granules while they are uncompacted and then subjecting polyamide molding granules to controlled heating above 200°C. in a solid-phase, plug-flow, gravity-conveyed polymerization zone.

3,821,172

FIBER TREATING AGENTS

Takahisa Sugiura, Takatsuki; Nobuyasu Arai, Toyonaka; Takashi Kato, Amagasaki, and Hiroshi Hotta, Kyoto, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 5, 1973, Ser. No. 329,432

Claims priority, application Japan, Feb. 5, 1972, 47-12978; Apr. 28, 1972, 47-43127

Int. Cl. C08f *15/00, 15/40*

U.S. Cl. 260—78.5 R **9 Claims**

Fiber treating agents containing copolymers of isobutylene or/and propylene, acrylic esters and optionally functional vinyl compounds, which impart to fibers desirable properties such as anti-pilling, hand-improving, water-proof and repellent, shrink- and crease-proof, dimension-stabilizing properties, and are useful as binders.

3,821,173

PROCESS FOR PRODUCING ARTICLES OF LACTONIZED ACRYLIC POLYMERS HAVING EXCELLENT WHITENESS

Yasuo Matsumura, and Kunio Maruyama, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Kita-ku, Osaka, Japan

Filed Jan. 16, 1973, Ser. No. 324,245

Claims priority, application Japan, Jan. 26, 1972, 47-9615

Int. Cl. C08f *7/12, 15/02*

U.S. Cl. 260—79.3 M **10 Claims**

Process for lactonizing an acrylic copolymer of acrylonitrile and a monomer containing a hydroxyl group, in an acidic medium, containing nitric acid and/or nitrates by carrying out lactonization while passing chlorine gas through the acidic medium.

3,821,174

CROSS-LINKED SHAPED OBJECTS OF VINYL CHLORIDE POLYMERS

Robert Buning, Troisdorf-Sieglar, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 57,772, July 23, 1970, abandoned. This application Oct. 2, 1972, Ser. No. 294,123

Int. Cl. C08 *11/04*

U.S. Cl. 260—80.71 **15 Claims**

Cross-linked vinyl chloride polymers are produced by employing as the linear vinyl chloride polymer a copolymer of vinyl chloride and a silane and effecting the cross-linking by contacting the linear polymer with hydrochloric or nitric acid.

Premature cross-linking, i.e. cross-linking before final shaping of the desired article such as filament or sheet, can be avoided by use of the process of the invention.

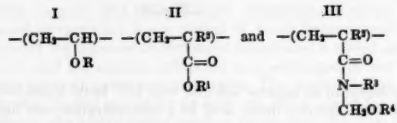
3,821,175

STABLE AQUEOUS EMULSIONS OF VINYL ETHER/ACRYLATE/N-ALKYLOL ACRYLAMIDE TERPOLYMERS AND TREATMENT OF TEXTILES THEREWITH

Wiley Edgar Daniels, Easton, Pa., and John Julian Duncan, Chatanooga, Tenn., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 29, 1971, Ser. No. 213,841
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.73 10 Claims

A terpolymer structure comprising the following repeating units,



wherein R and R^1 are C_1–C_{18} alkyl, R^2 is hydrogen or methyl, R^3 is hydrogen, C_{1-18} alkyl, arylakyl, or aryl and R^4 is hydrogen, C_{1-18} alkyl or cycloalkyl and wherein said structure contains approximately by weight 10 to 25 parts of unit I, 85 to 75 parts of unit II and 2 to 7 parts of unit III and a method of treating cellulosic fabric with a latex derived therefrom.

3,821,176

ACRYLONITRILE-(CO)-POLYMERS WITH ANTISTATIC FINISHES

Gunter Arend; Eduard Radlmann, and Gunther Nischk, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 1, 1972, Ser. No. 311,147
Claims priority, application Germany, Dec. 2, 1971, 2159833
Int. Cl. C08f *3/76, 15/22*
U.S. Cl. 260—85.5 R 8 Claims

The invention relates to acrylonitrile-(co)-polymers treated with antistatic finishes which are obtained by reacting hydroxyalkylated alcohols, amines or fatty acids with maleic acid anhydride, followed by an addition reaction with bisulphites or phosphites.

3,821,177

ACRYLONITRILE POLYMERIZATION TERMINATED WITH A SHORTSTOPPING AGENT

David Yee Hing Chan, 6361 Audubon Dr., Pensacola, Fla.

Filed Oct. 13, 1972, Ser. No. 297,551
Int. Cl. C08f *3/76, 15/02, 15/22*
U.S. Cl. 260—85.5 R 4 Claims

Polymerization of acrylonitrile in aqueous system using water-soluble redox catalyst system comprising oxidizing catalyst and reducing bisulfite activator is improved by (a) conducting the polymerization in the presence of 0.1 to 0.5 parts of sodium sulfoxylate formaldehyde per 100 parts of monomer to inhibit cyanide by-product formation and/or (b) the use of sodium sulfoxylate formaldehyde to shortstop the polymerization reaction while minimizing the formation of undesirable water-soluble acrylonitrile-bisulfite addition product.

3,821,178

PROCESS FOR THE BULK POLYMERIZATION OF ACRYLONITRILE

Paolo Melacini, Mestre; Luigi Patron; Alberto Moretti, both of Venezia, and Raffaele Tedesco, Mestre, all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Continuation-in-part of Ser. Nos. 136,901, April 23, 1971, and Ser. No. 290,982, Sept. 21, 1972. This application May 21, 1973, Ser. No. 362,315
Claims priority, application Italy, May 23, 1972, 24701/72
Int. Cl. C08f *3/76, 15/02, 15/22*
U.S. Cl. 260—85.5 R 4 Claims

Free-radical bulk polymerization of acrylonitrile with or without another copolymerizable ethylenically unsaturated monomer, using 2,2′-azo-bis(2-methyl-4-methyl-4-methoxyvaleronitrile) as a free-radical catalytic system having a decomposition rate constant (K_d) greater than 1 $hr.^{-1}$ at the polymerization temperature, a reaction time (Q) sufficient to semi-decompose the catalyst, and a catalyst concentration $(C)_o$ equal to or greater than $Q \times 2 \times 10^{-3}$ moles/liter, wherein "Q" is the residence time expressed in hours.

3,821,179

IONIC ETHYLENE COPOLYMERS CONTAINING SLIP/BLOCK ADDITIVES

Richard James Powell, Orange, Tex., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 6, 1972, Ser. No. 286,550
Int. Cl. C08f *15/04, 15/14*
U.S. Cl. 260—88.1 R 10 Claims

The addition of N,N′-di-erucyl adipamide or N,N′-di-erucyl sebacamide to ionic copolymers comprising an α-olefin of the general formula $RCH=CH_2$ where R is a radical selected from hydrogen and alkyl radicals having from one to eight carbon atoms and an α,β-ethylenically unsaturated carboxylic acid having three to eight carbon atoms, the olefin content of said copolymer being at least 50 mole percent based on the copolymer, the acid monomer content of said copolymer being from 0.2 to 25 mole percent based on the copolymer, said copolymer having from 10 percent to 90 percent of the carboxylic acid groups neutralized with metal ions, one or more metal ions having ionized valences of 1 to 3 inclusive, the resulting film having improved slip/block properties without chalking.

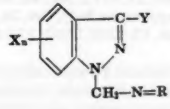
3,821,180

SURFACE-COATING COMPOSITIONS CONTAINING N-(SUBSTITUTED INDAZOLYL-N1-METHYL) ALKYLENEIMINES

Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Continuation-in-part of Ser. No. 201,159, Nov. 22, 1971, Pat. No. 3,766,192, which is a continuation-in-part of Ser. Nos. 689,812, Dec. 12, 1967, Pat. No. 3,641,050, and Ser. No. 141,999, May 10, 1971, Pat. No. 3,741,979. This application June 5, 1973, Ser. No. 367,265
Int. Cl. C09d *3/26, 5/14*
U.S. Cl. 260—89.1 10 Claims

Compounds that have the structural formula



(halobenzylidene)amino; attack wherein X represents halogen, nitro, amino, acetamino, aroylamino, or (halobenzylidiene)amino; Y represents hydrogen or halogen; R represents

an alkylene group having from four to eight carbon atoms; and n represents an integer in the range of zero to 2 are used to protect surface-coating compositions from deterioration resulting from attack by fungi and bacteria. Illustrative of these compounds are N-(5-nitroindazolyl-N¹-methyl)hexamethyleneimine and N-(3-chloroindazolyl-N¹-methyl)piperidine.

3,821,181

PROCESS FOR PRODUCING LINEAR POLYMERS OF ALICYCLIC COMPOUNDS

Tatyana Lvovna Jufa, ulitsa Mayakovskogo, 3, kv. 23; Irina Alexandrovna Poletaeva, ulitsa 111 Internatsionala, 74, kv. 212; Vitaly Abramovich Kormer, ulitsa Zheleznovodskaya, 62, kv. 2; Boris Davydovich Babitsky, ulitsa Krasnogo Kursanta, 7, kv. 9; Mark Iosifovich Lobach, Annikov prospekt, 28, kv. 52; Viktoria Vladimirovna Markova, 2 Murinsky prospekt, 44, kv. 88, and Lidia Alexandrovna Churlyaeva, ulitsa Avtovskaya, 2, kv. 147, all of, Leningrad, U.S.S.R.

Filed July 12, 1971, Ser. No. 162,020

Claims priority, application U.S.S.R., Aug. 13, 1970, 1452124

Int. Cl. C08f *1/30*

U.S. Cl. 260—91.5 **8 Claims**

A process for producing linear polymers of alicyclic compounds comprising at least two double bonds by polymerizing them in the presence of a catalyst comprising π-complexes of metals of group VI of the periodic system, as well as in the presence of compounds of said π-complexes with acceptors of organic and acidoligands. Polymerization is carried out in the mass of a monomer or in a solution of hydrocarbons, halogen derivatives thereof or ethers.

These catalysts enable the production of polymers with a high yield and at a good rate.

3,821,182

METHOD FOR PREPARING OF FILM OF A VINYLIDENE CHLORIDE POLYMER

William G. Baird, Jr., Winchester; Stanley E. Holbrook, South Acton, and Jeremy A. Platt, Cambridge, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 590,107, June 2, 1966, abandoned, which is a division of Ser. No. 157,194, Dec. 5, 1961, abandoned. This application Feb. 11, 1971, Ser. No. 114,692

Int. Cl. C08f *15/06*

U.S. Cl. 260—91.7 **5 Claims**

A vinylidene chloride polymer film, a method of producing a direct laminate of vinylidene chloride and a non-saran thermoplastic polymer, preferably polyethylene, including procedures for orienting and irradiating the laminate and the method above wherein the outer polymer layers are stripped from the saran to provide a saran film.

3,821,183

SOLUBLE POLYMERS HAVING ESSENTIALLY THE STRUCTURE OF POLYALKENAMER CHLORONITROESTERS AND METHODS OF PREPARING SAME

Gino Dall'Asta; Pietro Meneghini, and Ugo Gennaro, all of Milan, Italy, assignors to Montecatini Edison S. p. A., Milan, Italy

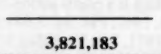
Filed Oct. 25, 1972, Ser. No. 300,861

Claims priority, application Italy, Oct. 26, 1971, 30314/71

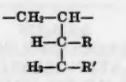
Int. Cl. C08f *27/02, 27/08*

U.S. Cl. 260—93.1 **12 Claims**

New soluble substituted polyakenamers are disclosed, the macromolecules of which consist, predominantly or essentially, of one or more repeating units which are the same or different and which have formula I:

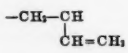
I 

in which n is a whole number from 2 to 10, and/or formula II:

II 

in which R and R′ are Cl or —O—NO_2, R and R′ being different.

A method for preparing the new polyalkenamer chloronitroesters is also disclosed and comprises reacting a polymer the macromolecules of which consist essentially of one or more repeating units —CH=CH—$(CH_2—)_n$ and/or



in solution in an organic solvent, with tert. butyl hypochlorite and with aqueous nitric acid in a concentration not higher than 85%.

3,821,184

ANTISTATIC AND DYEABLE THERMOPLASTIC MOLDING COMPOSITIONS AND SHAPED ARTICLES OF POLYOLEFINS

Jorn Ruter; Karl-Heinz Magosch; Konrad Rombusch, all of Marl, and Ursula Eichers, Recklinghausen, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

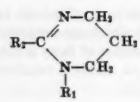
Filed Sept. 29, 1971, Ser. No. 184,938

Claims priority, application Germany, Oct. 2, 1970, 2048444The portion of the term of this patent subsequent to Oct. 31, 1989, has been disclaimed.

Int. Cl. C08f *29/02, 45/00*

U.S. Cl. 260—93.7 **16 Claims**

Antistatic polyolefin molding compositions and articles containing 0.1 – 5.0% by weight, based on the polyolefin, of one or more compounds of the formula:



wherein R_1 and R_2 both are alkyl or alkenyl of 6–25 carbon atoms.

3,821,185

HETEROPOLYSACCHARIDES AS STRIPPING ACIDS IN RECOVERY OF POLYMER FROM SOLUTION

Earl D. Cooper, and Dick S. Hall, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 18, 1972, Ser. No. 289,865

Int. Cl. C08d *500, 502*

U.S. Cl. 260—94.7 R **12 Claims**

Heteropolysaccharides, such as those derived from bacterial fermentation processes employing the genus Xanthomonas, are effective as stripping aids to obtain good rubber crumb by steam-stripping a solution of rubber-in-hydrocarbon solvent.

3,821,186

POLYMERISATION CATALYST

David Grant, Southampton, England, assignor to The International Synthetic Rubber Company Limited, Southampton, England

Filed Dec. 15, 1971, Ser. No. 208,425

Claims priority, application Great Britain, Dec. 22, 1970, 60835/70

Int. Cl. C08f 1/42, 3/06

U.S. Cl. 260—94.9 E 28 Claims

A process for the preparation of a polymerization catalyst, particularly an olefin polymerisation catalyst, comprises the steps of

1. forming a mixture comprising an organo-magnesium compound, an ether and an inert hydrocarbon liquid,
2. removing substantially all the free ether while subjecting the mixture to shear, and
3. including a hydrocarbon-soluble titanium or zirconium compound in the mixture before, during or after step (2).

Preferably a mixture of the organo-magnesium compound is admixed with the hydrocarbon liquid in the presence of a particulate support and this mixture subjected to shear at elevated temperature for a period of hours before cooling. Preferably the titanium or zirconium compound is added after step (2) and the mixture subjected to a prolonged period of further shear at ambient temperature. The whole process is preferably carried out under an inert gas and is useful for the formation of a highly active catalyst, particularly catalysts for the preparation of polyethylene and ethylene-propylene polymers.

3,821,187

PROCESS FOR PRODUCING CYCLIC COMPOUNDS OF CONJUGATED DIENE POLYMERS

Mitsuo Ichikawa, Tokyo; Yoshiyuki Harita; Mitsuru Tashiro, both of Yokohama, and Haruo Ito, Kawasaki, all of Japan, assignors to Japan Synthetic Rubber Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 182,820, Sept. 22, 1971, abandoned. This application May 16, 1973, Ser. No. 360,651

Claims priority, application Japan, June 25, 1971, 46-46130

Int. Cl. C08d 5/04

U.S. Cl. 260—94.7 HA 4 Claims

A process for producing cyclic compounds of conjugated diene polymers which comprises bringing at least one polymer selected from the group consisting of conjugated diene polymers and copolymers having unsaturated bonds in the main chain or side chain into contact with a catalyst composed of at least one compound selected from the group consisting of organoaluminum halides represented by the general formula R_2AlX or $R_3Al_2X_3$ (wherein R is alkyl group having one to 12 carbon atoms and X is a halogen) and at least one organic halogenated compound.

3,821,188

PROLINE AND PYROGLUTAMIC ACID CONTAINING TRIPEPTIDES

Wayne A. McKinley, Wallingford, and William H. McGregor, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed June 14, 1972, Ser. No. 262,887

Int. Cl. C07c 103/52; C07g 7/00

U.S. Cl. 260—112.5 5 Claims

Novel synthetic proline and/or pyroglutamic acid containing peptides are described which are useful for therapeutic purposes such as reduction of blood platelet adhesiveness.

3,821,189

N ALPHA-(SUBSTITUTED CARBOBENZYLOXYAMINO)-HEXANOYL)-NE-(CARBOBENZYLOXY)-L- LYSINE COMPOUNDS

Linneaus C. Dorman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 25, 1972, Ser. No. 291,813

Int. Cl. C07c 103/52; C08h 1/00

U.S. Cl. 260—112.5 9 Claims

Dipeptides of 6-(substituted carbobenzyloxyamino)-hexanoic acids and NE-(carbobenzyloxy)-L-lysine, useful as bronchial dilators.

3,821,190

REDUCTION OF AROMATIC NITRO COMPOUNDS TO AROMATIC AZOXY COMPOUNDS USING A PURE ACCICULAR CRYSTALLINE BENZOQUINONE AS A REDUCTION PROMOTER

Geoffrey R. Buckwalter, Flemington, N.Y., assignor to Bordon, Inc., Columbus, Ohio

Division of Ser. No. 728,765, May 13, 1968, abandoned. This application Feb. 22, 1971, Ser. No. 117,735

Int. Cl. C07c 49/64, 105/00, 109/04

U.S. Cl. 260—143 10 Claims

In the reduction of reducible aromatic nitrogen compounds by conventional reducing agents, a pure benzoquinone may be employed as a reduction promoter. Impure benzoquinone may be purified by various methods, such as by sublimation and by recrystallization. Substituted benzoquinones, such as halogenated or cyano-substituted benzoquinones, may be employed. The benzoquinone is employed in an amount ranging from about 0.5 to about 4.0 parts per 100 parts of the reducible aromatic nitrogen compound being treated. The presence of a metallic cyanide in the reaction mixture is advantageous, particularly in the reduction of the aromatic nitrogen from the azoxy to the hydrazo stage.

3,821,191

AZO PIGMENTS OF THE AMINOANTHRAQUINONYLAZO-HYDROXYNAPHTHOIC ACID SERIES

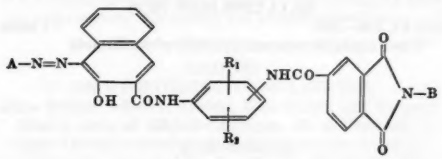
Guenther Ruider, 2 Carl-Bosch-Ring, 6710 Frankenthal, and Peter Dimroth, 1a Leuschnerstrasse, 6700 Ludwigshafen, both of Germany

Filed Dec. 2, 1971, Ser. No. 204,310

Int. Cl. C09b 1/16, 21/36; D06p 1/44

U.S. Cl. 260—152 2 Claims

Azo pigments of the formula



where A is an aminoanthraquinone, R_1 and R_2 are substituents and B is hydrogen, alkyl, aralkyl, aryl or heteroaryl, which are useful for dope dyeing, for print pastes for printing, for production of colored surface coatings, for dyeing phenoplasts, aminoplasts or thermoplasts, for textile printing, and in high grade printing inks. These pigments are particularly suitable for coloring polyvinyl chloride, polyethylene or polypropylene with excellent fastness to light, migration and overcoating.

3,821,192

PROCESS FOR PREPARING AN IRON-SACCHARIDE COMPLEX

Kenneth O. Montgomery, and Chandrakant R. Jhaveri, both of Seymour, Ind., assignors to The Central Pharmacal Company, Seymour, Ind.

Filed Aug. 18, 1971, Ser. No. 172,865
Int. Cl. C07c *47/18*
U.S. Cl. 260—209 R **6 Claims**

A process is disclosed for efficient preparation of a stable, soluble complex of iron with glucose, maltose, or dextrin which contains between 40 and 46 percent iron and which is suitable for oral use in treatment of iron deficiency anemia. A ferric compound and a saccharide compound are mixed with water and the pH adjusted to above 11. After reacting at 80°C., the complex is precipitated by the addition of methyl alcohol and the precipitate separated by centrifugation.

3,821,193

ANTIVIRAL COMPLEX OF RNA AND POLYSACCHARIDE

Louis R. Fare, Lafayette Hill; Moshe Goore, Norristown; James F. Naylor, III, Paoli, and Joseph R. Valenta, Strafford, all of Pa., assignors to Smithkline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 865,506, Oct. 10, 1969, abandoned. This application Sept. 16, 1970, Ser. No. 72,835
Int. Cl. C07c *69/20*; C07d *51/50*
U.S. Cl. 260—209 R **5 Claims**

A complex of single-stranded ribonucleic acid and polysaccharide, having antiviral activity, is obtained from the mold *Cunninghamella blakesleeana*. The complex is separated into the polysaccharide and nucleic acid components by chromatography.

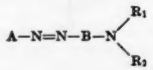
3,821,194

WATER-INSOLUBLE MONOAZO DYESTUFS

Richard Peter, Basel; Hans-Joerg Angliker, Riehen, and Klaus Artz, Muttenz, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 6, 1967, Ser. No. 688,350
Claims priority, application Switzerland, Dec. 27, 1966, 18616/66
Int. Cl. C09b *29/08, 29/36*
U.S. Cl. 260—207 **7 Claims**

Water-insoluble monoazo dyestuffs of the formula



in which A represents the radical of a diazo component, B represents a paraphenylene residue that may be substituted, R_1 represents an alkyl group that may be substituted by groups other than benzoyloxy groups and R_2 represents a residue of the formula —alkylene—O—COR_3, in which R_3 represents a benzene residue free from hydroxyl or carbalkoxy groups, a phenalkyl group, a styryl group, a five-membered heterocyclic residue or a nitrogen-free, six-membered heterocyclic residue, are useful for dyeing or printing polyester fibers in orange to blue tints fast to light and sublimation.

3,821,195

SYNTHESIS OF CYANOAZO DYES

Donald Edward Putzig, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1972, Ser. No. 249,209
Int. Cl. C09b *43/00*
U.S. Cl. 260—206 **11 Claims**

An improved process for replacing a bromo substituent with a cyano substituent in the production of a cyanoazo dye, which process comprises reacting cuprous cyanide and a bromo-azo dye having a bromo substituent in an aromatic ring position ortho to the azo group, for example 2-(2′-bromo-4′, 6′-dinitro-phenylazo)-5-diethylaminoacetanilide, in the presence of pyridine, at an elevated temperature, to produce the corresponding cyanoazo dye, for example, 2-(2′-cyano-4′,6′-dinitrophenylazo)-5-diethylaminoacetanilide, the improvement consisting of carrying out the reaction in the monomethyl or monoethyl ether of ethylene or diethylene glycol at a temperature of 75°C. to the boiling point of the glycol.

3,821,196

CARBOHYDRATE-BORON ALKOXIDE COMPOUNDS

Jett C. Arthur, Jr., Metairie, and Malkiat S. Bains, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 256,021, May 23, 1972, Pat. No. 3,790,562. This application Oct. 15, 1973, Ser. No. 406,407
Int. Cl. C08b *15/06*
U.S. Cl. 260—212 **4 Claims**

Fibrous cotton cellulose boron isoproxide or boron propoxide. Under anhydrous conditions, stable compounds of cotton cellulose and boron isopropoxide or boron propoxide were prepared in the neat boron alkoxide, the parent alcohol, benzene, pyridine, and/or ethylenediamine. The method of this invention has as its objective increasing the reactivity of the cotton cellulose with boron isopropoxide or boron propoxide by treatment in solutions of strong bases, such as pyridine and ethylene diamine. Formation of the fibrous cotton cellulose-boron isopropoxide or boron propoxide modifies the rate of oxidation of the cotton cellulose and is related to preparing flame resistant products.

3,821,197

PROCESS FOR THE PREPARATION OF 10,11-DIHYDRO-DIBENZO(B,F)AZEPINONES

Jean Fouche, Bourg-la-Reine, and Andre Leger, Massy, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Jan. 17, 1972, Ser. No. 218,528
Claims priority, application France, Jan. 19, 1971, 71.01647
Int. Cl. C07d *41/08*
U.S. Cl. 260—239 D **6 Claims**

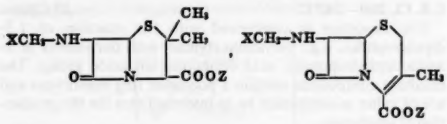
10,11-Dihydro-dibenzo[b,f]azepinones in which the nitrogen is substituted by alkyl, phenylalkyl, or amino-alkyl, which have, or are intermediates for compounds having, useful pharmacological activity are made by cyclizing corresponding alkyl esters of N-substituted N-ortho-tolylanthranilic acids with alkali metal amides in the presence of hexamethylphosphotriamide.

3,821,198
DERIVATIVES OF 6-AMINO PENICILLANIC ACID

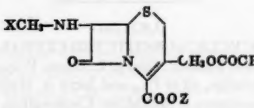
Bong Kuk Lee, Old Bridge; Dewey D. Y. Ryu, East Brunswick, and Felix Edward Pansy, Jamesburg, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 3, 1972, Ser. No. 249,840
Int. Cl. C07d 99/16
U.S. Cl. 260—239.1 3 Claims

New penicillin and cephalosporin derivatives and methods for preparing the same are provided, said derivatives having the structures



and



wherein Z is hydrogen, lower alkyl on a salt forming ion and X is aryl, substituted aryl, lower alkyl, cyclohexadienyl, cycloalkyl or saturated or unsaturated N-, O- or S-containing heterocyclic rings. These compounds are useful as antibacterial agents.

3,821,199
N-DERIVATIVES OF 4-AMINO-4-DESOXY-RIFAMYCIN SV AND PREPARATION

Renato Cricchio, Varese, Italy, assignor to Gruppo Lepetit S.p.A., Milano, Italy

Filed Jan. 14, 1972, Ser. No. 217,955
Claims priority, application Italy, Jan. 18, 1971, 19460/71
Int. Cl. C07d 99/02, 99/04
U.S. Cl. 260—239.3 P 10 Claims

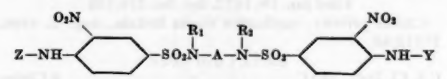
N-derivatives of 4-amino-4-desoxy-rifamycin SV are prepared by reacting in an organic solvent medium rifamycin O with a secondary amine having lower alkyl, lower alkenyl, cycloalkyl, phenyl, cycloalkyl-lower alkyl or phenyl-lower alkyl substituent groups, or wherein a hetero N compound is substituted for the secondary amine, to give the titular compounds which are recovered from the reaction medium in usual ways. The products have antimicrobial activity.

3,821,200
NITRODIPHENYLAMINE DYESTUFFS

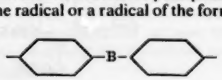
Hans Alfred Stingl, Brookside Heights, N.J., assignor to Toms River Chemical Corporation, Toms River, N.J.

Filed Jan. 16, 1968, Ser. No. 698,099
Int. Cl. C07d 51/70
U.S. Cl. 260—239.7 9 Claims

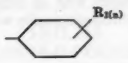
Nitrodiphenylamine compounds of the formula



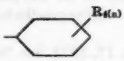
wherein A represents a single bond or a divalent radical which is an aliphatic straight or branched chain hydrocarbon of from one to 12 carbon atoms, a meta- or para-phenylene radical, a paradiphenylene radical or a radical of the formula



in which B is CH_2, O, S or N—R_5; R_1, R_2 and R_5 represent hydrogen, lower alkyl such as methyl, ethyl, propyl or butyl, hydroxyalkyl, particularly hydroxy lower alkyl such as hydroxymethyl, hydroxyethyl, hydroxypropyl or hydroxybutyl, cycloalkyl such as cyclohexyl, phenyl or when A is alkylene R_1 and R_2 together are alkylene; Y and Z can be the same or different and are selected from the group consisting of cyclohexyl, the radical of the formula



and the radical of the formula



wherein n is 0, 1, 2 or 3 and R_3 and R_4 are hydrogen, lower alkyl such as methyl, ethyl, propyl or butyl, hydroxy lower alkyl, lower alkoxy such as methoxy, ethoxy, propoxy or butoxy, halogen such as chlorine or bromine, trifluoromethyl or acylamino such as acetylamino, carbamoyl or sulfamoyl, and R_3 and R_4 can be in ortho, meta or para position, are yellow dyestuffs particularly suitable for the dyeing and printing of synthetic fibers.

3,821,201
DIBENZO(C,E)AZEPIN-5-ONES

Arsenio A. Pessolano, Colonia; Bruce E. Witzel, Westfield; Patricia M. Graham, Mountainside; Robert L. Clark, Woodbridge, and Tsung-Ying Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 9, 1971, Ser. No. 170,384
Int. Cl. C07d 41/08
U.S. Cl. 260—239.3 T 13 Claims

Novel substituted-dibenzo[c,e]azepin-5-ones. The dibenzo[c,e]azepin-5-ones disclosed herein are potent anti-inflammatory, anti-pyretic and analgesic agents. Also included herein are pharmaceutical compositions containing said dibenzo[c,e]azepin-5-one compounds as an active ingredient, and methods of treating inflammation, fever and pain in patients by administering said compounds. Further encompassed is 6,7-dihydro-5H-dibenzo[c,e]azepin-5-one possessing novel anti-inflammatory, anti-pyretic and analgesic activities.

3,821,202
PROCESS FOR PURIFYING LACTAMS

Hans Helmut Schwarz, Krefeld; Otto Immel, and Hermann Schnell, both of Krefeld-Uerdingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 126,346, March 19, 1971, abandoned. This application May 4, 1973, Ser. No. 357,360
Int. Cl. C07d 53/06
U.S. Cl. 260—239.3 A 2 Claims

This invention relates to a process for the removal of oximes from lactams which comprises treating an oxime-containing lactam obtained by the catalytic rearrangement of an oxime in the gaseous phase with sulphur dioxide at a temperature of from 70° to 170°C. and up to a concentration of at least 1 mol of sulphur dioxide based on 1 mol of the oxime removing on completion of the reaction the excess sulphur dioxide and recovering the lactam by distillation.

3,821,203

SEPARATION OF BENZODIAZEPINE COMPOUNDS

Shigeo Ogino, Ashiya; Fumitaka Kishimoto, Takarazuka, and Hiroo Wada, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company Limited, Osaka, Japan

Filed June 16, 1972, Ser. No. 263,468

Claims priority, application Japan, June 18, 1971, 46-44059

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D 1 Claim

Benzodiazepine compounds are separated from each other by extracting the material containing the mixture of benzodiazepine compunds with an organic solvent and subjecting the extract to chromatography with hydroxypropylated dextran gel.

3,821,204

2-ARYLIMINOPYRROLIDINES AND THEIR PRODUCTION

Edgar Enders, Cologne; Wilhelm Stendel, Wuppertal-Elberfeld; Jurgen-Dietrich Meier, Cologne, and Marc Francque, Monheim, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

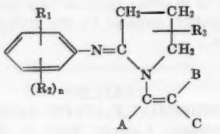
Filed Sept. 17, 1971, Ser. No. 181,613

Claims priority, application Germany, Sept. 19, 1970, 2046413

Int. Cl. C07d *27/04*

U.S. Cl. 260—240 F 59 Claims

2-Phenyliminopyrrolidines of the formula:



(I)

or salts thereof,

wherein

R_1 is halogen,

R_2 is hydrogen, halogen, alkyl of 1 to 6 carbon atoms, difluoromethyl or trifluoromethyl,

R_3 is hydrogen or alkyl, preferably lower alkyl,

n is an integer from 1 to 4, and

A, B and C each represent hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, or A and B, or B and C are linked to each other to form a ring, provided that at least one of A, B and C is alkyl or alkenyl,

are useful as acaricides.

3,821,205

DYES AND PHOTOGRAPHIC EMULSION AND ELEMENTS CONTAINING SAID DYES

Arthur Fumia, Jr., and Donald W. Heseltine, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 56,653, July 20, 1970, Pat. No. 3,652,288.

This application Nov. 23, 1971, Ser. No. 201,570

Int. Cl. C09b *23/14*

U.S. Cl. 260—240 D 7 Claims

Novel polymethine cyanine dyes are derived from certain enamines containing a cyclohexene ring having a reactive methylene or methyl substituent thereon. These dyes are spectral sensitizers for photographic silver halide emulsions and sensitize such emulsions up to wavelengths ranging about from 550 mu to 770 mu. Many of the dyes are useful sensitizers for the red to near infrared regions of the spectrum.

3,821,206

CEPHALOSPORINS HAVING A POLYAZOLE SUBSTITUENT

Brian Richard Cowley, London; Gordon I. Gregory, Chalfont St. Peter, and Alan G. Long, Greenford, all of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Continuation of Ser. No. 688,693, Dec. 7, 1967, abandoned.

This application Jan. 20, 1971, Ser. No. 108,189

Claims priority, application Great Britain, Dec. 15, 1966, 5630/66

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 23 Claims

The invention is concerned with the reaction of 1,3-dipolarophiles, e.g., dicyanoacetylene, with derivatives of 7-aminocephalosporanic acid containing an azido group. The resultant compounds contain a polyazole ring substituent and are of value as antibiotics or as intermediates for the production of antibiotics.

3,821,207

7-HETEROCYCLIC SUBSTITUTED CEPHALOSPORINS

Alfred W. Chow, Radnor; George L. Dunn, Wayne; John R. E. Hoover, Glenside, all of Pa., and Jerry A. Weisbach, Cherry Hill, N.J., assignors to Smithkline Corporation, Philadelphia, Pa.

Filed June 21, 1971, Ser. No. 155,281

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 5 Claims

7-Heterocyclic α-amino or α-hydroxyacetamidocephalosporins with various 3-substituents are prepared by conventional 7-acylation and 3-displacement reactions. The products are antibacterial agents.

3,821,208

RECOVERY OF CEPHALOSPORIN C AND DERIVATIVES THEREOF

Harry Carson Stables; John Atherton, both of Ulverston, and Michael John Matchan, Barrow-in-Furness, all of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

Filed Aug. 17, 1971, Ser. No. 172,553

Claims priority, application Great Britain, Aug. 25, 1970, 40880/70

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 11 Claims

A process for the recovery of cephalosporin C as a derivative thereof from a cephalosporin C - containing aqueous medium, e.g., a fermentation broth includes the step of contacting the medium with formaldehyde and a β-ketoester followed by isolation of the derivative of cephalosporin C so formed, e.g., by extraction into an organic solvent.

3,821,209

CEPHALOSPORIN DERIVATIVES

Benjamin Harry Arnold, Slough; Robert Anthony Fildes, Ulverston, and David Arthur Gilbert, Slough, all of England, assignors to Glaxo Laboratories Limited, Greenford, Middlesex, England

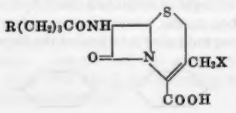
Filed Jan. 19, 1972, Ser. No. 219,138

Claims priority, application Great Britain, Aug. 2, 1968, 37113/68

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 4 Claims

Cephalosporin derivatives having antibacterial activity or of value of intermediates have the formula



wherein R is -CO·COOH or -COOH and X is an acetate group, a hydroxy group, a hydrogen atom or the residue of a nucleophile.

3,821,210

TETRAHYDRO-1,3-THIAZINIUM SALTS

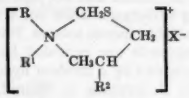
Ludwig Konrad Huber, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 24, 1972, Ser. No. 220,372

Int. Cl. C07d *93/06*

U.S. Cl. 260—243 R **11 Claims**

Tetrahydro-1,3-thiazinium salts of the formula



where X is an anion, R^2 is hydrogen or hydroxyl, and R and R^1 are alkyl, hydroxyl substituted alkyl, or a heterocyclic ring, are prepared by reacting a secondary amine with formaldehyde and a 3-halopropanethiol. The salts are useful as pesticides and as sensitizers for photographic silver halide emulsions.

3,821,211

PROCESS FOR THE PREPARATION OF 4-HYDROXY-3-(5-METHYL-3-ISOXAZOLYCARBAMOYL)-2-METHYL-2H-1, 2-BENZOTHIAZINE 1,1-DIOXIDE

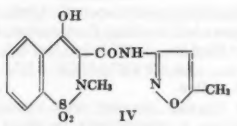
Jagadish C. Sircar, Dover; Harold Zinnes, Rockaway, and John Shavel, Jr., Mendham, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Mar. 10, 1972, Ser. No. 233,712The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **2 Claims**

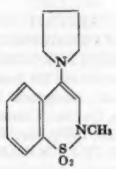
A process for the production of the compound of the formula:



IV

is described.

This process comprises treating compound I:



I

with phosgene and triethylamine to form the compound enamine-acid chloride. This enamine-acid chloride is treated with 3-amino-5-methylisoxazole to give the corresponding enamine-amide, followed by hydrolysis to give the above described compound.

3,821,212

3,4-DIHYDRO-1-METHYL-11H-1,4-OXAZINO(4,3-B)-1,2-BENZOTHIAZIN-11-ONE 6,6-DIOXIDE

Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Inc., Fort Washington, Pa.

Filed Oct. 2, 1972, Ser. No. 294,118

Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **1 Claim**

The compound herein is 3,4-dihydro-1-methyl-11H-1,4-oxazino[4,3-b]-1,2-benzothiazin-11-one 6,6-dioxide, useful for its ultra-violet absorbing properties.

3,821,213

OXIDES OF 10-H-PYRAZINO(2,3-B)(1,4)BENZOTHIAZINE

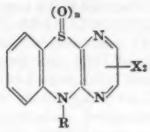
Yulan C. Tong, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 24, 1972, Ser. No. 299,885

Int. Cl. C07d *93/18*

U.S. Cl. 260—243 AN **5 Claims**

Tricyclic pyrazino compounds of the general formula



wherein each X is, independently, H, halogen or $-OCH_3$; R is H or an alkyl or aralkyl group; and n is 1 or 2, have been found to be useful as fungicides.

3,821,214

OXAZINE DERIVATIVES

Max Wilhelm, Allschwil, and Walter Riess, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

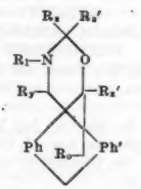
Division of Ser. No. 820,319, April 29, 1969. This application July 28, 1972, Ser. No. 276,005

Claims priority, application Switzerland, May 16, 1968, 7284/68; Mar. 25, 1969, 4480/69

Int. Cl. C07d *87/14*

U.S. Cl. 260—244 R **4 Claims**

Compounds of the formula



in which Ph and Ph' are optionally substituted o-phenylene radicals, R_1 stands for hydrogen or a radical of aliphatic nature, R_o, R_x' and R_y each represents hydrogen or lower alkyl, R_x and R_x' each represents hydrogen, lower alkyl, aralkyl or aryl, or both together stand for a lower alkylene, are useful psychopharmaceuticals.

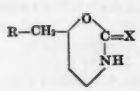
3,821,215

NOVEL DERIVATIVES OF SUBSTITUTED TETRAHYDRO M-OXAZINES, THEIR PROCESS OF PREPARATION AND THEIR THERAPEUTIC APPLICATION

Claude P. Fauran; Colette Douzon; Guy M. Raynaud, all of Paris, and Micheline Y. Sergant, Clamart, all of France, assignors to Delalande S.A., Courbevoie, France

Filed May 5, 1972, Ser. No. 250,741
Claims priority, application France, May 7, 1971, 71.16526
Int. Cl. C07d *87/08*
U.S. Cl. 260—244 R 10 Claims

Compounds of the formula



in which X is oxygen or sulfur and R is methoxy, phenoxy or morpholino, are prepared by cyclizing the corresponding 1-substituted-4-amino-2-butanol with a compound containing a

group. The compounds possess analgesic, spasmolytic, vasodilatory, hypertensive and antidepressive properties.

3,821,216

POLYHALO-4-PYRIDINE SULFEN AND SULFONAMIDES

Penelope B. Domenico, Danville, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 861,462, Sept. 26, 1969, abandoned. This application July 10, 1972, Ser. No. 270,071
Int. Cl. C07d *31/26*
U.S. Cl. 260—247.1 24 Claims

Disclosed are polyhalo-4-pyridine sulfen- and sulfonamides and a method of making them. These compounds are useful as pesticides.

3,821,217

1-MORPHOLINO-1-CYANO-0-CARBAMOYL-FORMOXIMES

Hans Ulrich Brechbuhler, Basel, and Kurt Gubler, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 844,163, July 23, 1969, Pat. No. 3,673,236. This application Apr. 13, 1972, Ser. No. 243,820
Int. Cl. C07d *87/42*
U.S. Cl. 260—247.2 A 1 Claim

New basically substituted 1-cyano-0-carbamoyl-formoximes are described as insecticides, acaricides and nematocides, which are distinguished from known carbamoyl-oximes by pronounced systemic insecticidal, acaricidal and nematocidal action. A typical compound is 1-diethylamino-0-(N'-methylcarbamoyl)-formoxime. Processes for the production of these compounds are described as well as pesticidal compositions containing these compounds as active substances.

3,821,218

NITROGEN-CONTAINING ORGANOSILICON MATERIALS

Abe Berger, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 870,718, Aug. 15, 1969, Pat. No. 3,598,852, which is a division of Ser. No. 669,298, Sept. 20, 1967, Pat. No. 3,494,951, said Ser. No. 870,718, is a continuation-in-part of Ser. No. 669,284, Sept. 20, 1967, Pat. No. 3,517,001. This application Dec. 8, 1970, Ser. No. 96,281
Int. Cl. C07d *55/38*
U.S. Cl. 260—248 NS 3 Claims

A method is provided for making various nitrogen-containing organosilicon compounds, such as silylorganoisocyanates, the corresponding carbamate and isocyanurates. The method involves contacting silylorganohalide and a metal cyanate in the presence of a suitable aprotic solvent. Nitrogen-containing organosilicon compounds are provided having silicon and nitrogen atoms separated by a divalent hydrocarbon radical. In instances where a urethane is desired, an appropriate aliphatic monohydric alcohol can be utilized in combination with the silylorganohalide and metal cyanate. The subject nitrogen-containing organosilicon compounds can be utilized for making silicon-organic copolymers and as treating agents for imparting water repellency to various substances.

3,821,219

TRIAZINONES

Kang Lin, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 15, 1972, Ser. No. 289,458
Int. Cl. C07d *55/50*
U.S. Cl. 260—248 NS 4 Claims

Certain triazinones are excellent selective herbicides that can be used both preemergence and post-emergence in the presence of wheat, barley, and rye. These herbicides are very effective against wild oats.

3,821,220

REDUCING HYDROGEN CYANIDE LEVELS IN THE FORMATION OF CYANOALKYLAMINO SUBSTITUTED TRIAZINES

Hiram G. Daugherty, and Harvey G. Little, both of Jackson, Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 4, 1972, Ser. No. 215,435
Int. Cl. C07d *55/20, 55/22*
U.S. Cl. 260—249.6 3 Claims

Hydrogen cyanide present with cyanoalkylamino substituted triazines is reacted with an agent which serves to reduce this HCN concentration. Examples of suitable agents are formaldehyde, sodium hypochlorite and hydrogen peroxide.

3,821,221

1,2,3,6-TETRAHYDROPYRIMIDINE-2-ONE COMPOUNDS AND PROCESSES FOR MAKING THEM

Ctirad Podesva, and Jose Maria Do Nascimento, both of Montreal, Quebec, Canada, assignors to Delmar Chemicals Limited, Ville La Salle, Quebec, Canada

Filed Aug. 25, 1970, Ser. No. 66,872
Int. Cl. C07d *51/38*
U.S. Cl. 260—251 R 8 Claims

Tetrahydropyrimidine-2-one compounds which have been found to possess useful biological properties in that such compounds act through the central nervous system as depressants and/or stimulants. For use as medicaments, the novel tetrahydropyrimidine compounds are normally administered in the form of pharmaceutical compositions containing, as an active ingredient, at least one of the tetra-

hydropyrimidine compounds in association with a physiologically acceptable carrier. Illustrative of such compounds are 1-(2'-hydroxyphenyl)-4-(3''-nitrophenyl)-1,2,3,6-tetrahydropyrimidine-2-one which shows CNS-depressant effects and 1-adamantyl-4-(3'-nitrophenyl)-1,2,3,6-tetrahydropyrimidine-2-one which shows CNS stimulant effects.

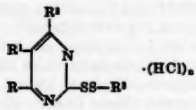
3,821,222

HYDROCARBYL SULFENYLMERCAPTO PYRIMIDINES

Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 22, 1971, Ser. No. 201,185
Int. Cl. C07d 51/40, 51/38
U.S. Cl. 260—256.5 R 5 Claims

Compounds of the formula



wherein R, R^1 and R^2 are hydrogen, halogen, hydroxy, alkyl or alkenyl optionally substituted with halogen atoms and R^3 is an aliphatic hydrocarbyl group or an aryl group or

wherein R^4 is hydrogen or alkyl and R^5 is hydrogen, alkyl, alkenyl or phenyl optionally substituted with halogen atoms, and *n* is 0 or 1, possess fungicidal and insecticidal activity.

3,821,223

5-CHLORO-6-METHYL-3-NEOPENTYLURACIL

James R. Kuszewski, East Longmeadow, Mass.; Raymond W. Luckenbaugh, and Winston J. Wayne, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 14, 1971, Ser. No. 162,653
Int. Cl. C07d 51/30
U.S. Cl. 260—260 1 Claim

The compound 5-chloro-6-methyl-3-neopentyluracil selectively controls many weeds in corn and soybeans.

3,821,224

MAGNESIUM OROTATE GLYCINATE AND ITS COMPLEX COMPOUND WITH MAGNESIUM GLYCINATE AND THEIR PREPARATION

Hans Braeuer, Asternweg 6, 8011 Vaterstetten near Munich, and Hans Brinkhoff, Heerstrasse 24, 8000 Munich 60, both of Germany

Continuation of Ser. No. 36,488, May 11, 1970, abandoned. This application Jan. 25, 1972, Ser. No. 220,709
Claims priority, application Germany, May 12, 1969, 1924174
Int. Cl. C07d 51/30
U.S. Cl. 260—260 10 Claims

The water soluble and substantially non-toxic magnesium orotate glycinate and its complex compound with magnesium glycinate are useful agents in the treatment of magnesium deficiency disorders and diseases.

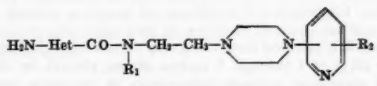
3,821,225

PYRIDYL PIPERAZINES

Gilbert Regnier, Chatenay-Malabry; Roger Canevari, Villebon S/Yvette, and Jacques Duhault, Chatou, all of France, assignors to Science Union Et Cie, Suresnes, France

Filed May 5, 1972, Ser. No. 250,567
Claims priority, application Great Britain, May 14, 1971, 14877/71
Int. Cl. C07d 51/70
U.S. Cl. 260—268 H 4 Claims

Pyridyl piperazines of the formula:



wherein Het is pyridyl, pyrimidinyl, pyridazinyl or pyrazinyl in which NH_2 is in a para position to CO, R_1 is hydrogen or lower-alkyl and R_2 is hydrogen, lower alkyl or lower alkoxy.

These compounds possess broncholytic, antianaphylactic and central nervous system depressant properties.

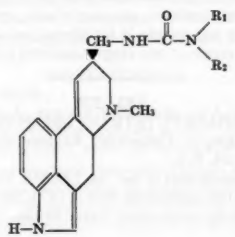
3,821,226

6-METHYL-8B-UREIDO-ERGOLENES

Theodor Fehr, General Guisanstrasse, 4144 Arlesheim; Peter Stuetz, 189 Oeltingerstrasse, 4057 Basel, and Paul Stadler, 7 Jakobsweg, 4105 Biel-Benken, all of Switzerland

Filed May 15, 1972, Ser. No. 253,105
Claims priority, application Switzerland, May 19, 1971, 7379/71; May 19, 1971, 7381/71; May 19, 1971, 7383/71; Dec. 15, 1971, 18262/71
Int. Cl. C07d 43/20
U.S. Cl. 260—285.5 8 Claims

This invention provides compounds of the formula:



wherein each of R_1 and R_2 is hydrogen, or alkyl of 1 to 4 carbon atoms, or R_1 and R_2 together form an alkylene chain of at most 5 carbon atoms,

and acid addition salts thereof.

The invention also provides processes for the production of said compounds.

The compounds are useful antihypertensive agents.

3,821,227

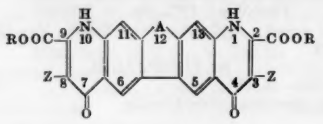
4,7 DIOXO 12H-CYCLOPENTA (2, 1-8:3,4 G') DIQUINOLINE 2,9 DICARBOXYLIC ACID DERIVATIVES

Charles M. Hall, and Herbert G. Johnson, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 20, 1972, Ser. No. 308,035
Int. Cl. C07d 39/00, 51/70
U.S. Cl. 260—286 R 3 Claims

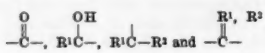
This invention relates to novel compounds, methods for preparing them and pharmaceutical compositions containing

them, and a process for the prophylactic treatment of allergic conditions employing said compositions. These novel compounds are embraced by the formula



I

wherein R is selected from the group consisting of hydrogen, lower alkyl of 1 through 3 carbon atoms, phenyl, an alkali metal, aluminum, calcium, magnesium, or an amine cation, said amine being selected from the group consisting of ammonia, an alkyl amine, ethanolamine, tris-(hydroxymethyl)aminomethane, D-threo-2-amino-1-(p-nitrophenyl)-1,3-propanediol, N,N-bis(hydroxyethyl)piperazine, 2-amino-2-methyl-1-propanol, 2-amino-2-methyl-1,3-propanediol and 2,2-bis(hydroxymethyl)-2,2',2''-nitrilotriethanol; Z is selected from the group consisting of hydrogen, phenyl, and lower alkyl of 1 through 3 carbon atoms; A is selected from the group consisting of



wherein R^1 and R^2 are selected from the group consisting of hydrogen and lower alkyl of 1 through 6 carbon atoms.

The compounds (I), above, are formulated with pharmaceutical carriers for oral, parenteral, rectal and local administration with insufflation being the preferred method. The compositions are useful in the prophylactic treatment of sensitized humans and mammals for allergy and all anaphylactic reactions of a reagin or non-reagin mediated nature.

3,821,228

2-AMINOALKYL TETRAHYDROQUINOLINES

Hugh Colin Richards, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 732,850, May 29, 1968, abandoned. This application May 3, 1971, Ser. No. 139,955

Claims priority, application Great Britain, June 10, 1967, 26893/67

Int. Cl. C07d *33/38*

U.S. Cl. 260—288 R **7 Claims**

Novel 2-aminoalkyl-7-substituted-1,2,3,4-tetrahydroquinoline compounds, useful as effective anti-schistosomal agents, are disclosed and suitable modes of preparation are described. These compounds all possess either nitro, cyano or halogen substituted at the 7-position of the molecule, in addition to having a methyl, hydroxymethyl, alkoxymethyl or formyl group located at the adjacent 6-position.

3,821,229

DIQUATERNARY SALTS OF DI-4-PYRIDYL KETONE

Donald Roy Maulding, Branchburg, Township, Somerset Cty., N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 7, 1972, Ser. No. 313,028

Int. Cl. C07d *31/44*

U.S. Cl. 260—294.8 R **5 Claims**

New compounds which are bis aryl ketones where the aryl group contains nitrogen or nitrogen and sulfur, which are useful in chemiluminescent compositions.

3,821,230

SUBSTITUTED SULFONYL BORNANE-CARBOXAMIDES AND NONBORNANE CARBOXAMIDES

Hermann Bretschneider; Kraft Hohenlohe-Oehringen, both of Innsbruck, Austria; Andre Grussner, Basel, Switzerland, and Klaus Zur Nedden, Marl, Germany, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 8,390, Feb. 3, 1970, Pat. No. 3,707,558. This application Oct. 10, 1972, Ser. No. 296,481

Int. Cl. C07d *29/34*

U.S. Cl. 260—293.56 **5 Claims**

Bicyclic carboxamide derivatives, prepared, inter alia, by reacting, for example, a camphor-3-carboxylic acid or non-camphor-3-carboxylic acid derivative with a sulfonic acid amide, are described. The bicyclic carboxamide derivatives are useful as hypoglycemic agents.

3,821,231

METHOD FOR PREPARATION OF N-SUBSTITUTED 4-ANILINE PIPERIDINES

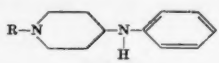
Edvard Stanislavovich Lavrinovich, ulitsa Bolshaya Besher 5/9, kv. 14; Skaidrite Karlovna Germane, ulitsa Zalya, 3, kv. 16a, Riga; Ilze Edgarovna Treigute, Ulitsa Lenina, 29, Kv. 1, Olaine, and Matisovich Gunar Edzhe, ulitsa Rupnietsibas, 16, kv. 18, Riga, all of U.S.S.R.

Filed Oct. 15, 1971, Ser. No. 189,783

Int. Cl. C07d *29/28*

U.S. Cl. 260—293.79 **5 Claims**

A method for the preparation of N-substituted 4-anilino piperidines having the general formula



where R is an alkyl group having from 1 to 16 carbon atoms, C_6H_5CH—, or $C_6H_4(CH_2)_2$—, comprising reacting 4-anilinopyridine with an alkyl or aralkyl halide having the general formula R-X, where R is an alkyl group having from 1 to 16 carbon atoms, $C_6H_5CH_2$—, or $C_6H_5(CH_2)_2$— and X is Cl, Br or I, with subsequent reduction of the formed N-substituted 4-anilinopyridinium quarternary salt with sodium borohydride in an aqueous-organic solvent and isolation of the main product.

The proposed invention can be used in the synthesis of certain medical preparations, for example analgesic phentanyl and some other physiologically active compounds.

3,821,232

1,2-DIHYDRO-PYRIDINE-N-PHOSPHONATES AND THIOPHOSPHONATES

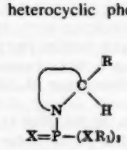
Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, Wilmington, Del.

Filed Dec. 20, 1971, Ser. No. 210,106

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 K **8 Claims**

Dihydro-nitrogen heterocyclic phosphoramidates of the general formula



where

represents a dihydro-nitrogen ring, R is a substituted group, preferably hydrocarbon, X is O or S, and R_1 is an alcohol or

phenolic moiety, preferably hydrocarbon; the preparation and uses thereof particularly as corrosion inhibitors, microbiocides, etc.

3,821,233

RIGIDIZED CARBOCYANINE DYES CONTAINING A PYRIDA-DIPYRIDINIUM NUCLEUS

Lewis L. Lincoln, and Donald W. Heseltine, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 85,707, Oct. 30, 1970, Pat. No. 3,679,427. This application Apr. 19, 1972, Ser. No. 245,391

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 A 11 Claims

Rigidized carbocyanine dyes including at least two nitrogen-containing heterocyclic nuclei with a nitrogen atom of each nucleus joined by a 5 carbon polyene chain, each heterocyclic nucleus also having the non-metallic atoms to complete, in combination with the two nitrogen atoms and the carbon atoms of the intervening polyene chain, a nucleus which is either 3,4,5a,6,7,8-hexahydro-4aH-pyrano[3,2-c;5,6-c'] dipyridine or an analog wherein the member in the 5-position is alternatively one such as a sulfur atom, a nitrogen atom, a selenium atom, etc, are useful as spectral sensitizing dyes for silver halide. Since they are structurally rigidized, their absorption envelope is more selective, and they exhibit high stability in solution and an increased fluorescence efficiency when compared to similar, but non-rigidized dyes. The high degree of fluorescence makes these compounds advantageous also as textile dyes, plastics dyes and colorant dyes for related situations including cosmetics, e.g., nail polish, facial coloring compositions, lipsticks or the like. Additionally, these rigidized carbocyanine dyes are desirable as colorants for coatings like paints, lacquers and the like when dispersed or dissolved therein.

3,821,234

1-PYRAZOLY-ALKYL-4-PHENYL-3,4-DEHYDROPIPERIDINES

Volker Koppe; Karl Schulte; Joachim Borck; Eike Poetsch, and Helmut Muller-Calgan, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit Beschraenkter Haftung, Darmstadt, Germany

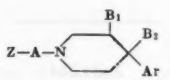
Filed Dec. 7, 1971, Ser. No. 205,707

Claims priority, application Germany, Dec. 10, 1970, 2060816

Int. Cl. C07d *29/38*

U.S. Cl. 260—295 AM 17 Claims

Piperidine derivatives of the formula



wherein Z is a 1,3-benzodioxolyl-5, a pyrazolyl-3, pyrazolyl-4, pyrazolyl-5, or thiazolyl-5 residue, or one of the latter four residues substituted by one or both of one or more alkyl groups of from one to four carbon atoms and an N-acyl group; A is linear of branched alkylene of one to six carbon atoms; B_1 and B_2 each are H or OH, or collectively a C—C bond; and Ar is phenyl or a phenyl group substituted by one or more members selected from the group consisting of halogen atoms and alkyl and alkoxy each of one to four carbon atoms, and their acid addition and quaternary ammonium salts have useful pharmacological properties, including a tranquilizing effect.

3,821,235

PYRIDONE DERIVATIVES

Raphael Ralph G. Haber, Givatayim, and Chaim Simonovitch, Rishon Letzion, both of Israel, assignors to Abic Ltd., Ramat-Gan, Israel

Filed Apr. 6, 1972, Ser. No. 241,847

Int. Cl. C07d *31/36*

U.S. Cl. 260—295.5 R 34 Claims

The present invention deals with 2,6-dimethyl-1,4-dihydro-4-oxo-3,5-pyridine-dicarboxylates and derivatives, a manner for their preparation and their utility as anti-inflammatory agents. The said 4-oxo pyridines of the present invention commonly referred to the chemical literature as 4-(1H)-pyridones are suitably prepared by reacting a 2,6-dimethyl-4-oxo-3,5-pyronedicarboxylate with an aniline in an acetic medium such as acetic acid.

3,821,236

CERTAIN 2-HALO-1,2,4-THIADIAZOLE DISULFIDES

David Eugene Ripple, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed May 3, 1972, Ser. No. 249,806

Int. Cl. C07d *91/60*

U.S. Cl. 260—302 SD 7 Claims

3-Halo-1,2,4-thiadiazolyl 5-disulfides and 1,2,4-thiadiazolyl 3,5-bis(disulfides) are prepared by reaction of mercaptans with the corresponding sulfenyl chlorides. The disulfides are useful as corrosion inhibitors in lubricants.

3,821,237

THIAZOLYL BENZOIC ACID COMPOUNDS

Charles Malen, Fresnes, and Pierre Desnoyers, Fontenay-aux-Roses, both of France, assignors to Science Union et Cie Societe Francaise De Recherche Medicale, Suresnes, France

Filed Dec. 2, 1969, Ser. No. 881,590

Claims priority, application Great Britain, Dec. 16, 1968, 59720/68

Int. Cl. C07d *91/32*

U.S. Cl. 260—302 R 14 Claims

m-(thiazol-4-yl) benzoic acids substitued in 2- and optionally 5-position of the thiazol ring by lower alkyl, phenyl-alkyl, phenyl, halo-phenyl, lower alkylphenyl or lower alkoxy-phenyl, and on the phenyl ring of the benzoic acid moiety by halogen, hydroxyl, lower alkyl or lower alkoxy. These compounds possess fibrinolytic, platelet stickiness decreasing and antiulcer properties and have an impact on the immunological processes.

3,821,238

2-(B-AMINOETHYLSULFONYLAMINE) THIAZOLE

Shun-Ichi Naito, 35 Murasakino Kanutondocho, Kita-ku, Kyoto, Japan

Division of Ser. No. 164,007, July 19, 1971, Pat. No. 3,743,647. This application Dec. 1, 1972, Ser. No. 311,278

Claims priority, application Japan, Aug. 27, 1970, 45-75350; Aug. 27, 1970, 45-75351; Aug. 27, 1970, 45-75352; Dec. 18, 1970, 45-114446; Dec. 18, 1970, 45-114447

Int. Cl. C07d *91/34*

U.S. Cl. 260—306.8 R 2 Claims

Aminoethanesulfonyl derivatives having a general formula $R\text{-}SO_2CH_2CH_2Y$ where R is selected from a group consisting of thiazolyl-2-amino, 1-pyrrolyl, 4-methylpiperazyl, and 1-indolyl and Y is NH_2 or, when R is thiazolyl-2-amino, said Y may be nicotinoylamino as well as manufacture methods thereof were disclosed.

3,821,239
CERTAIN N-THIAZOL-2-YLUREAS

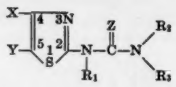
Jean Claude Guillot, Eaubonne; Pierre Poignant, Lyon, and Jacques De Bazelaire de Lesseux, Rueil-Malmaison, all of France, assignors to Rhone-Progil, Courbevoie, France

Continuation-in-part of Ser. No. 540,192, April 5, 1966, Pat. No. 3,551,442. This application Mar. 2, 1970, Ser. No. 15,900

Int. Cl. C07d *91/46*

U.S. Cl. 260—306.8 R **10 Claims**

A thiazole derivative having the general formula



and pesticidal compositions containing the same.

3,821,240
BIS-TRIAZOLE COMPOUNDS

Horst Aebli, Basle; Fritz Fleck, Bottmingen; Hans Kittl, Riehen, and Horst Schmid, Munchenstein, all of Switzerland, assignors to Sandoz Ltd., Basle, Switzerland

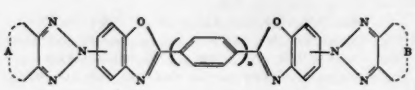
Filed Dec. 28, 1971, Ser. No. 213,162

Claims priority, application Switzerland, Dec. 31, 1970, 19360/70; Jan. 14, 1971, 597/71

Int. Cl. C07d *85/48*

U.S. Cl. 260—307 D **8 Claims**

Bis-triazole compounds of formula



(I)

where

A and B each stands for the atoms or groups of atoms necessary for the formation of dihydrated derivatives of aromatic carbocycles or heterocycles which may bear non-ionic substituents

and *n* has a value from 1 to 6, e.g., 1,4-bis-[6′-naphthotriazolyl-(2″)-benzoxazolyl-2′]-benzene, which are eminently suitable as optical brighteners for organic materials especially plastics, giving very fast optical brightenings.

3,821,241
1-IMIDAZOLYL-2-SUBSTITUTED HYDROXY PROPYL AMINES

Paul Schmidt, Therwil; Peter Moser, both of Birsfelden, and Guenther Winkmann, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 19, 1971, Ser. No. 117,153

Claims priority, application Switzerland, Feb. 26, 1970, 2803/70; June 16, 1970, 9090/70

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **6 Claims**

The present invention relates to new amines, particularly 1-imidazolyl-2-hydroxy propyl amines which may be further substituted on the nitrogen atom by aryl or lower alkyl or 1-imidazolyl-2-substituted hydroxy propyl amines, which may be further substituted on the nitrogen atom by aryl or lower alkyl, which are suitable as chemotherapeutics against influenza.

3,821,242
DIGLYCIDYL ETHERS

Juergen Habermeier, Allschwil; Hans Batzer, Arlesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 24, 1971, Ser. No. 118,499

Claims priority, application Switzerland, Mar. 5, 1970, 3272/70; Oct. 26, 1970, 15776/70The portion of the term of this patent subsequent to July 25, 1989, has been disclaimed.

Int. Cl. C07d *49/32*

U.S. Cl. 260—309.5 **5 Claims**

Diglycidyl ethers of binuclear, five-membered or six-membered, unsubstituted or substituted, N-hetero-cyclid compounds containing two NH groups in the molecule and containing added-on butene oxide, produced by reaction of binuclear, five-membered or six-membered, unsubstituted or substituted, N-heterocyclic compounds, such as bis-(hydantoin) or bis-(dihydrouracil) compounds, for example 1,1′-methylene-bis-(5,5-dimethylhydantoin, 1,6-(bis-(5,5-dimethyl-hydantoinyl-3)-hexane or β,β'bis-(5,5-dimethylhydantoinyl-3)-diethyl ether, with butene oxide, for example, 1,2-butene oxide, to give monoalcohols or dialcohols, and subsequent glydidylation of the OH groups or of the OH group and the NH group to give the corresponding glycidyl ethers.

3,821,243
HETEROCYCLIC TRIGLYCIDYL COMPOUNDS

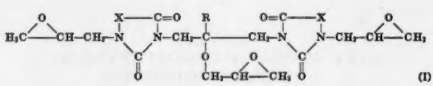
Juergen Habermeier, Pfeffingen, and Daniel Porret, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 28, 1972, Ser. No. 238,982

Int. Cl. C07d *49/32*

U.S. Cl. 260—309.5 **3 Claims**

The invention relates to new triglycidyl compounds of the formula:



(I)

wherein X represents a bivalent alkylene group required for the formation of a 5- or 6-membered heterocycle, and R represents hydrogen or an alkyl group having 1 to 4 carbon atoms.

The new triglycidyl compounds are stable in storage and from them are obtained, after curing, synthetic materials having good mechanical strength and high dimensional stability under heat.

3,821,244
2-AMINO-4-PHENYL-2-IMIDAZOLINES

William Lesley Matier, and William Timmey, Evansville, both of Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Continuation-in-part of Ser. No. 172,321, Jan. 16, 1971, abandoned. This application July 3, 1972, Ser. No. 268,380

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.6 **29 Claims**

The novel compounds of this invention are of the imidazoline class of heterocycles having substituents in the 2 and 4 imidazoline ring positions and optionally in the 3-position. Substituents in the 2-position include amino, hydroxyamino, alkylamino, benzylamino, halobenzylamino, dihalo benzylamino, allylamino, cycloalkylamino, hydrazino, and al-

kylidenehydrazino. Optional 3-position subsitutents are alkyl and benzyl. The substituent in the 4-position is comprised of phenyl or R-phenyl in which the R-substituent is selected from halogen, alkyl, benxyloxy, alkoxy, dialkoxy, 3-hydroxy, 3,4-dihydroxy, trifluoromethyl, phenyl, halophenyl, or alkylphenyl. The novel imidazolines have antihypertensive and neuronal blocking properties. They are prepared by cyclization of appropriately substituted 1-phenylethylenediamines with cyanogen bromide or by displacement of a methylmercapto grouping from an appropriately substituted 2-methylthioimidazoline. Representative embodiments of this invention are 2-amino-4-(4-chlorophenyl)-2-imidazoline and 2-amino-4-(3,4-dichlorophenyl)-2-imidazoline.

3,821,245
PRODUCTION OF N-VINYL PYRROLIDONE

Junichi Kanetaka; Takashi Shimodiara, and Kuniaki Hayashi, all of Ami-Machi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo-to, Japan

Filed July 19, 1971, Ser. No. 164,138

Claims priority, application Japan, July 17, 1970, 45-62681; Feb. 28, 1971, 46-7080

Int. Cl. C07d *27/08*

U.S. Cl. 260—326.5 FN **7 Claims**

In a method for producing N-vinylpyrrolidone by dehydrating N-(β-hydroxyethyl)-2-pyrrolidone employing a catalyst, the catalyst is made of an oxide of a metal selected from the group of zirconium, thorium, cerium, zinc, and chromium, whereby not only is the yield of the N-vinylpyrrolidone significantly improved, but the reaction can be carried out at atmospheric pressure.

3,821,246
O-ETHYL-S-ALKYL-S-PHTHALIMIDO-ALKYL-PHOSPHORODITHIOLATES

Shigeo Kishino, Tokyo; Akio Kudamatsu; Kozo Shiokawa, both of Kanagawa, and Shinichi Yamaguchi, Tokyo, all of Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

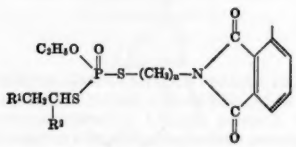
Filed June 28, 1972, Ser. No. 266,955

Claims priority, application Japan, July 7, 1971, 46-49589

Int. Cl. C07d *27/52*

U.S. Cl. 260—326 E **8 Claims**

O-ethyl-S-alkyl-S-phthalimido-alkyl-phosphorodithiolates of the general formula



(I)

wherein

R^1 is methyl or alkoxy of 1 to 6 carbon atoms,

R^2 is hydrogen or methyl, and

n is 1 or 2, which possess insecticidal, acaricidal and nematocidal properties.

3,821,247
N-(SUBSTITUTED PHENYL)-2,3-DICHLOROMALEIMIDES

Elmar Sturm, Arlesheim, and Raphael Menasse, Basil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

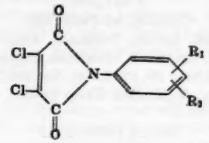
Filed Mar. 17, 1972, Ser. No. 235,826

Claims priority, application Switzerland, Apr. 2, 1971, 4861/71; Feb. 16, 1972, 2239/72

Int. Cl. C07d *27/18*

U.S. Cl. 260—326.5 S **5 Claims**

Compounds of the formula



wherein R_1 represents halogenomethyl or the group $R_3S(O)_x$—, R_2 represents hydrogen or halogen, R_3 represents C_1–C_4 alkyl, X is 0, 1 or 2, or R_1 and R_2 represent halogenomethyl, with the proviso that, if R_1 is trifluoromethyl and at the same time R_2 represents hydrogen, R_1 is in the 3- or 4-position, their manufacture and agents for combating phytopathogenic fungi containing them are disclosed.

3,821,248
BIS-(P-CHLORPHENOXY) ACETIC ACID ESTERS

Rudolf G. Griot, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Division of Ser. No. 615,316, Feb. 13, 1967, Pat. No. 3,575,988, said Ser. No. 615,316, is a continuation-in-part of Ser. No. 598,970, Dec. 5, 1966, abandoned, which is a continuation-in-part of Ser. No. 568,759, July 29, 1966, abandoned, which is a continuation-in-part of Ser. No. 549,475, May 12, 1966, abandoned. This application May 27, 1970, Ser. No. 51,402

Int. Cl. C07d *27/04*

U.S. Cl. 260—326.47 **3 Claims**

The compounds are of the class of basic esters of bis-(p-chlorophenoxy) acetic acid, e.g., bis-(p-chlorophenoxy)acetic acid B-(1-methyl-2-pyrrolidinyl)ethyl ester, which are useful as hypocholesteremic/hypolipemic agents.

3,821,249
DIBENZOTHIAZEFIN DERIVATIVES

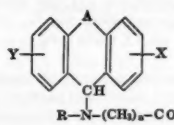
Charles Malen, Fresnes; Bernard Danree, St. Germain en Laye, and Jean-Claude Poignant, Wissous, all of France, assignors to Societe en nom collectif Science Union et Cie, Societe Francais de Recherche Medicale, Suresnes, France

Division of Ser. No. 019,503, March 13, 1970, Pat. No. 3,758,528. This application Oct. 30, 1972, Ser. No. 301,997

Int. Cl. C07d *93/42*

U.S. Cl. 260—327 B **7 Claims**

Tricyclic compounds of the formula:



wherein:

A is $-(CH_2)_m-$, $-CH=CH-$, $-(CH_2)_p-O-$, $-(CH_2)_p-S-$,

$-(CH_2)_p-SO_2-$, $-(CH_2)_p-NR_1$ or $-SO_2-NR_2-$ in which m is 1, 2 or 3, p is 1 or 2, R_1 is hydrogen or lower alkyl and R_2 is lower alkyl:

X and Y are hydrogen or halogen:

R and R' are hydrogen or lower alkyl, and

n is an integer of from 1 to 12 inclusive.

These compounds possess psychostimulant, antidepressive, analgesic, antitussive, antihistaminic and gastric antisecretory properties.

3,821,250

CHEMICAL PROCESS

Gert Peter Jansen, Farum, Denmark, assignor to Beecham Group Limited, Brentford, Middlesex, England

Filed Nov. 19, 1971, Ser. No. 200,520

Claims priority, application Great Britain, Dec. 30, 1970, 61736/70

Int. Cl. C07d *63/12*

U.S. Cl. 260—329 R **8 Claims**

Tetrahydrothiophene-3-one is reacted with cyanoacetic acid or a salt or ester thereof to produce the novel mixture of 3-cyano-2,5-dihydrothiophene, 3-cyanomethyl-4,5-dihydrothiophene, and cis and trans-3-cyanomethylenetetrahydrothiophene. This mixture is converted into 3-thienylacetonitrile by dehydrogenation or oxidation. The produced 3-thienylacetonitrile can be further converted to 3-thienylmalonic acid which in turn may be converted to α-carboxy-3-thienylmethylpenicillin or an ester thereof.

3,821,251

DISUBSTITUTED XANTHONE CARBOXYLIC ACID COMPOUNDS

Jurg R. Pfister, Los Altos; Ian T. Harrison, and John H. Fried, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 12, 1972, Ser. No. 217,300

Int. Cl. C07d *7/44*

U.S. Cl. 260—335 **13 Claims**

Compositions containing and methods employing, as the essential ingredient, novel disubstituted xanthone carboxylic acid compounds which are useful in the treatment of allergic conditions. Methods for preparing these compounds and compositions and intermediates therein are also disclosed. 5-Methylthio-7-isopropoxyxanthone-2-carboxylic acid and 5,7-di-(methylthio)xanthone-2-carboxylic acid are illustrated as representative compounds.

3,821,252

6-ACYL-XANTHONE-2-CARBOXYLIC ACIDS

Jurg R. Pfister, Los Altos; Ian T. Harrison, and John H. Fried, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 231,756, March 3, 1972. This application June 5, 1972, Ser. No. 259,671

Int. Cl. C07d *7/44*

U.S. Cl. 260—335 **4 Claims**

Compositions containing and methods employing, as the essential ingredient, novel substituted xanthone carboxylic acid compounds which are useful in the treatment of allergic conditions. Methods for preparing these compounds and compositions and intermediates therein are also disclosed. 6-Acetyl-xanthone-2-carboxylic acid is illustrated as a representative compound.

3,821,253

NAPHTHYL ACETALDEHYDE DERIVATIVES; METHODS OF USE THEREOF; AND PROCESSES FOR THE PREPARATION THEREOF

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif. assignors to Syntex Corporation, Apartado, Panama

Division of Ser. No. 814,855, April 9, 1969, which is a continuation-in-part of Ser. No. 741,900, July 2, 1968, Pat. No. 3,626,012. This application Jan. 31, 1972, Ser. No. 222,278

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 **16 Claims**

2-(2'-Naphthyl) acetaldehyde derivatives optionally substituted at the 2 position and/or positions C-1',4',5',7' or 8'; and/or position C-6' or positions C-5' and 7' exhibit anti-inflammatory, analgesic, antipyretic and anti-pruritic activity.

3,821,254

PROCESS FOR THE PREPARATION OF 3-(3'-LOWER CARBOALKOXY-4'-HYDROXY-1'-NAPHTHYL)-3-(3''-CARBOXY-4''HYDROXY-1''-NAPHTHYL)NAPHTHALIDE

Paul S. Huyffer, West Boxford, and John J. Wasatonic, Cambridge, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 11, 1972, Ser. No. 314,096

Int. Cl. C07d *7/10*

U.S. Cl. 260—343.2 R **9 Claims**

Carboxy-substituted 1-naphthol naphthalide indicator dyes are prepared by a base-catalyzed reaction of a 2-carboxy-1-naphthol and a 3-Z-3-(3'-lower carboalkoxy-4'-hydroxy-1'-naphthyl)naphthalide wherein Z is a leaving group to form the dye precursor which is then hydrolyzed to yield the corresponding indicator dye product.

3,821,255

PROCESS FOR PREPARING BICYCLIC LACTONE DIOLS

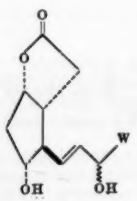
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 181,246, Sept. 16, 1971, Pat. No. 3,711,515, which is a continuation-in-part of Ser. No. 92,483, Nov. 27, 1970, abandoned. This application Dec. 15, 1972, Ser. No. 315,362

Int. Cl. C07d *5/32*

U.S. Cl. 260—343.3 **5 Claims**

Process for preparing (1) bicyclic lactone diols of the formula



wherein W is 1-pentyl, cis 1-pent-2-enyl or 1-pent-2-ynyl, and (2) prostaglandins E_3 and F_3 in their racemic and optically active configurations, their enantiomorphs, and their 15-

epimers; and the products prepared therein. The diols are useful intermediates in preparing prostaglandins having pharmacological utility.

3,821,256

2,3-DIHYDROBENZOFURANYLMETHYL CHRYSANTHEMIC ESTERS

Robert Vollrath, Bad Duerkheim; Walter Boell, Mutterstadt; Guenther Scheuerer, Ludwigshafen, and Heinrich Adolphi, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Feb. 17, 1972, Ser. No. 227,281
Claims priority, application Germany, Feb. 25, 1971, 2108932
Int. Cl. C07d 5/34
U.S. Cl. 260—346.2 R 4 Claims

New and valuable chrysanthemic esters containing as alcohol component a 2,3-dihydrobenzofuryl methyl alcohol and a process for controlling pests with these compounds.

3,821,257

TRIMELLITIC ACID ANHYDRIDE RECOVERY BY MULTI-DISTILLATION OF FLUID OXIDATION EFFLUENT CONTAINING TRIMELLITIC ACID, AQUEOUS ACETIC ACID, METAL CATALYST COMPONENTS AND ORGANIC OXIDATION BY-PRODUCTS WHEREIN PRIOR TO ONE DISTILLATION STEAM STRIPPING IS USED

J. Michael Woollen, Chicago, and James D. Knobloch, Naperville, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Feb. 9, 1971, Ser. No. 114,046
Int. Cl. C07c 63/32
U.S. Cl. 260—346.4 6 Claims

Trimellitic acid anhydride (intra-molecular anhydride of trimellitic acid) has poor initial molten color and molten color stability when recovered by vacuum fractional distillation of partially purified trimellitic acid anhydride (TMA) obtained by distilling aqueous acetic acid from fluid oxidation effluent from oxidation of pseudocumene with molecular oxygen to trimellitic acid in the presence of acetic acid and catalysis provided by polyvalent-transitional metal and source of bromine, thermal conversion to crude TMA of trimellitic acid of residue from said distillation and flashing partially purified TMA from said thermal conversion. Attendant poor initial molten color and molten color stability disadvantages are substantially eliminated by steam stripping partially purified TMA prior to vacuum fractional distillation.

3,821,258

Patent Not Issued For This Number

3,821,259

METHOD OF SIMULTANEOUS PRODUCTION OF OLEFINE OXIDES AND ACETIC ACID

Erna Albertovna Bljumberg, Leninsky prospekt, 57, kv.10; Demid Vasilievich Ivanjukov, Karmanitsky pereulok, 10, kv. 4; Sergei Alexeevich Maslov, Smolensky bulvar, 14/22, kv. 9; Jury Dmitrievich Norikov, prospekt Vernadskogo, 113, kv. 91; Nikolai Markovich Emanuel, Vorobieuskoe, shosse 2 "b", kv. 44, and Vladimir Vasilievich Boiko, Kaptonya, 1 kvartal, dom 12, kv. 2, all of Moscow, U.S.S.R.

Filed May 26, 1972, Ser. No. 257,349
Int. Cl. C07d 1/08
U.S. Cl. 260—348.5 V 3 Claims

A method for the simultaneous production of olefin oxides and acetic acid consisting in concurrent oxidation of olefins and acetaldehyde with an oxygen-containing gas in the presence of a catalyst in the form of a silver compound or vanadium oxides.

3,821,260

CERTAIN 5-ALKYLNYL-2-FURYLMETHYL ESTERS OF 2,2,3,3-TETRAMETHYL CYCLOPROPANE CARBOXYLIC ACID

Yoshio Katsuda, Osaka, and Takashi Ohno, Takarazuka-shi, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan and Dainippon Jochugiku Co., Ltd., Osaka, Japan, an equal share to each

Filed Jan. 10, 1969, Ser. No. 790,447
Claims priority, application Japan, Jan. 16, 1968, 43-2486; June 3, 1968, 43-38155; July 2, 1968, 43-46361
Int. Cl. C07d 5/16
U.S. Cl. 260—347.4 8 Claims

5-Lower alkynyl-furylmethyl 2,2,3,3-tetramethyl-cyclopropane-1-carboxylates, which are harmless to mammals and inexpensive, and insecticidal compositions containing the same. The said carboxylates are prepared by the esterification of 5-lower alkynyl-furylmethyl alcohols or reactive derivatives thereof with 2,2,3,3-tetramethyl-cyclopropane-1-carboxylic acid or reactive derivatives thereof.

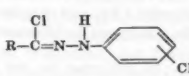
3,821,261

CHLORO SUBSTITUTED FURFURAL PHENYL HYDRAZONES

Girts Kaugars, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 78,166, Oct. 5, 1970, Pat. No. 3,699,111.
This application Aug. 31, 1972, Ser. No. 285,439
Int. Cl. C07d 5/16, 5/18
U.S. Cl. 260—347.7 3 Claims

This invention relates to novel heterocyclic acid chloride phenylhydrazones embraced by the formula



I

wherein R is a radical selected from the group consisting of furyl, thienyl, and pyridyl, each of which has from zero through three substituents selected from the group consisting of alkyl, halo and nitro, and *n* is an integer of from zero through three. These compounds are primarily useful as insecticides and miticides and also as herbicides, anti-inflammatories and anthelmintics.

3,821,262

PROCESS FOR THE PRODUCTION OF ANTHRAQUINONE DERIVATIVES CHLORINATED IN ALPHA-POSITIONS

Wolfgang Schoenauber, Riehen, Bagel, and Karl Ulrich Steiner, Binningen, Baselland, both of Switzerland, assignors to Sandoz Ltd., Basle, Switzerland

Continuation-in-part of Ser. No. 750,016, Aug. 5, 1968, abandoned. This application June 7, 1971, Ser. No. 150,733
Claims priority, application Switzerland, Aug. 11, 1967, 11370/67; Sept. 14, 1967, 12875/67; Mar. 8, 1968, 3535/68; June 6, 1968, 8382/68
Int. Cl. C09b 1/10, 1/22, 1/50
U.S. Cl. 260—380 9 Claims

A process for the production of anthraquinone derivatives which are substituted in the 1,4-positions by amino and/or hydroxyl groups and are α-chlorinated by chlorinating these derivatives in the form of the boric acid or boron fluoride complex compounds in the presence of halogenation catalysts, which consists in using for chlorination a mixture of oleum and chlorosulphonic acid or thionyl chloride.

3,821,263

FLAME RETARDANT HALOGEN AND PHOSPHORUS CONTAINING POLYOLS

Morton Lewis, Elmhurst, Ill., assignor to Swift & Company, Chicago, Ill.

Filed Sept. 27, 1972, Ser. No. 292,742
Int. Cl. C07f 9/02; A23j 7/00
U.S. Cl. 260—403 17 Claims

Phosphonated high molecular weight polyol esters and polyol ethers are prepared by reacting a halogen-containing high molecular weight hydroxy-containing polyether, polyester or polyether polyester with an alkali metal salt of a dialiphatic or a diaryl acid phosphite. The invention provides a means for introducing a carbon-phosphorus covalent bond into the molecule of a high molecular weight polyol without destroying the hydroxyl functionality.

3,821,264

HALOHYDRINS OF 2,4-DIUNSATURATED ALIPHATIC CARBOXYLIC ESTERS

Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed May 11, 1972, Ser. No. 252,383
Int. Cl. C07c 69/66; A01n 9/24
U.S. Cl. 260—408 10 Claims

Novel unsaturated aliphatic carboxylic esters substituted at C-4 with a halogen atom, intermediates therefor, and the control of insects.

3,821,265

PRODUCTION OF CARBOXYLIC ACIDS

Denis Forster, University City, and Arnold Hershman, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 19, 1971, Ser. No. 200,518
Int. Cl. C08h 17/36
U.S. Cl. 260—413 16 Claims

Production of carboxylic acids by carboxylation of ethylenically unsaturated compounds utilizing a stabilized catalyst system comprising a rhodium or iridium compound, a halide promoter and a molybdenum or chromium compound as a stabilizer component.

3,821,266

PROCESS FOR THE PREPARATION OF THIOHYDROXIMIC ESTERS

Albertus J. Mulder, and Robert Van Helden, both of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Filed July 3, 1972, Ser. No. 268,373
Int. Cl. C07c 119/18, 119/20
U.S. Cl. 260—453 R 7 Claims

Thiohydroximic esters of the formula

wherein R^1 and R^2 are individually an optionally substituted hydrocarbyl group and R^1 may also be hydrogen, are prepared by reacting a nitro compound $R^1\text{-}CH_2NO_2$ with a thiol R^2SH in the presence of a solid non-acid gamma-alumina containing catalyst.

3,821,267

A-ACYLTHIO-P-CYCLOHEXYLPHENYLACETIC ACID AND DERIVATIVES

Julius Diamond, Lafayette Hill, and Norman Julian Santora, Roslyn, both of Pa., assignors to William H. Rorer, Inc., Ft. Washington, Pa.

Continuation-in-part of Ser. No. 34,870, May 5, 1970. This application June 11, 1971, Ser. No. 152,451
Int. Cl. C07c 153/07
U.S. Cl. 260—455 R 7 Claims

Novel α-mercapto-p-cycloalkylphenylacetic acids and their derivatives have been prepared. Compounds of this invention possess useful anti-inflammatory, analgesic and antipyretic properties.

3,821,268

α-ACYLTHIO BIPHENYLYLACETIC ACIDS

Julius Diamond, Lafayette Hill, and Norman Julian Santora, Roslyn, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 34,870, May 5, 1970. This application June 11, 1971, Ser. No. 152,366
Int. Cl. C07c 153/07
U.S. Cl. 260—455 R 12 Claims

Novel α-mercapto-p-biphenylylacetic acids and their derivatives have been prepared. Compounds of this invention possess useful anti-inflammatory, analgesic and antipyretic properties.

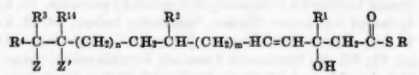
3,821,269

THIOLESTERS OF 3-HYDROXY-3,7,11 SUBSTITUTEDTHIOL DODECEMOATES OR UNDECENOATES

Clive A. Henrick, and John B. Siddall, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Dec. 18, 1972, Ser. No. 316,305
Int. Cl. C07c 153/07
U.S. Cl. 260—455 R 10 Claims

Aliphatic β-hydroxy olefinic thiolesters, synthesis thereof, which are useful intermediates and insect control agents of the formula



wherein, each of R, R^1, R^2, R^3 and R^4 is lower alkyl; R^{14} is hydrogen or methyl; *m* and *n* is zero, one or two; Z, when

taken separately, is hydrogen, lower alkyl, lower alkoxy or lower alkylthio; Z', when taken separately, is hydrogen; and Z and Z', when taken together, form a carbon-carbon bond.

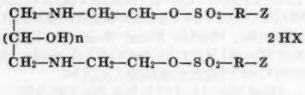
3,821,270

NEW 2-SULPHONYLOXY-ETHYLAMINO DERIVATIVES

Laszlo Vargha; Tibo Horvath; Maria Halasz; Endre Csanyi, and Boris Dumbovich, all of Budapest, Hungary, assignors to Chinoin Gyogyszer- Es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Jan. 29, 1971, Ser. No. 111,089
Int. Cl. C07c *143/38, 143/26;* A61k *27/00*
U.S. Cl. 260—456 A 3 Claims

2-Sulphonyloxy-ethylamino derivatives and salts thereof having the formula



wherein *n* is an integer from 1 to 4, R represents an unsubstituted or a with one or more Z groups substituted aryl, aralkyl or cycloalkyl group, Z represents a hydrogen or halogen atom or a methyl, methoxy or nitro group and X stands for a pharmaceutically acceptable inorganic or organic acid residue, which possess favourable cytostatic properties.

3,821,271

11-SUBSTITUTED-DESA-PREGNANES AND DERIVATIVES THEREOF

Milan Radoje Uskokovic, Montclair, and Thomas Henry Williams, Cedar Grove, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 736,569, June 13, 1968, abandoned, which is a division of Ser. No. 499,094, Oct. 20, 1965, Pat. No. 3,574,761, which is a continuation-in-part of Ser. No. 400,206, Sept. 29, 1964, Pat. No. 3,412,107. This application May 26, 1971, Ser. No. 147,263
Int. Cl. C07c *143/20*
U.S. Cl. 260—456 R 6 Claims

This invention is directed to 11-substituted-desA-pregnanes and derivatives thereof which are useful as intermediates in the production of 9β, 10α-known steroids of the pregnane series. These latter compounds can be utilized as progestational and salt-retaining agents.

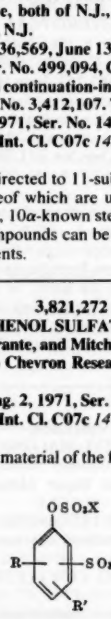
3,821,272

DIALKYLPHENOL SULFATE-SULFONATE

Ralph House, El Sobrante, and Mitchell Danzik, Pinole, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 2, 1971, Ser. No. 168,477
Int. Cl. C07c *141/16*
U.S. Cl. 260—457 4 Claims

A detergent active material of the formula



in which R and R' are substantially linear alkyl groups of from about 8 to 22 carbon atoms and X is H or a water-soluble salt-forming cation and the sum of the carbon atoms in R and R' is from 18 to 40 carbon atoms, preferably 22 to 30 carbon atoms.

3,821,273

NOVEL DIALKYL PEROXYDICARBONATES

Antonio Joseph D'Angelo, Buffalo, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed July 30, 1970, Ser. No. 59,696
U.S. Cl. 260—463 4 Claims

Novel solid, thermally safe and stable di-n-alkyl (tridecyl, tetradecyl, pentadecyl or hexadecyl) peroxydicarbonates; and the use thereof in polymerizing ethylenically unsaturated monomers and in curing unsaturated polyester resin compositions.

3,821,274

PROCESS FOR PREPARING 2-(β-CYANOETHYL)-N-SUBSTITUTED ACETALDIMINES

Gerrit E. Beekhuis, Geleen, and Joseph F. M. Klein, Bunde, both of Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed Feb. 8, 1972, Ser. No. 224,615
Claims priority, application Netherlands, Feb. 18, 1971, 712136
Int. Cl. C07c *121/02*
U.S. Cl. 260—464 3 Claims

A process for preparing 2-(β-cyanoethyl)-N-substituted acetaldimines by the reaction of acrylonitrile and an N-substituted acetaldimine is disclosed, wherein the reaction is conducted in the presence of at least one compound which is an alkali metal oxide, an alkaline-earth metal oxide, an alkali metal hydroxide, an alkaline-earth metal hydroxide, an alkali metal salt or an alkaline-earth metal salt derived from an acid having a dissociation constant less than 10^{-5}.

3,821,275

METHOD OF PRODUCING 1,3-BIS (CYANOMETHYL) ADAMANTANE

Yoshiaki Inamoto, Wakayama, and Takeji Kadono, Kainan, both of Japan, assignors to Kao Soap Co. Ltd., Tokyo, Japan

Filed Apr. 3, 1972, Ser. No. 240,760
Claims priority, application Japan, June 24, 1971, 46-45901
Int. Cl. C07c *121/46*
U.S. Cl. 260—464 2 Claims

1,3-Bis(cyanomethyl) derivatives of adamantane and alkyladamantanes are prepared by a one-step reaction of (1) the corresponding 1,3-bis(carboxymethyl) derivatives of adamantane and alkyladamantanes with (2) ammonia, in the presence of catalyst, at an elevated temperature. The compounds are useful as starting materials for producing various types of synthetic resins.

3,821,276

3-CYANOBENZENESULFONAMIDES

Helmut H. Mrozik, Matawan and Richard J. Bochis, East Brunswick, both of N.J., assignors to Merck & Co., Inc. Rahway, N. J.

Filed Jan. 7, 1972, Ser. No. 216,283
Int. Cl. C07c *121/52*
U.S. Cl. 260—465 E 6 Claims

Novel substituted 3-cyanobenzenesulfonamides are useful as agents for the treatment of both mature and immature liver fluke infections. The benzenesulfonamide may be substituted on the sulfonamide nitrogen with loweralkyl, and substituted loweralkyl. The benzene ring is optionally substituted at the 4-position with amino and variously substituted at the 5-position. Compositions containing these compounds for the treatment of mature and inmature liver fluke infections are also disclosed.

3,821,277

γ-METHOXY-γ-CARBANILINO-α,ω-DICYANOPENTANE

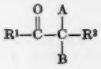
Horst Koenig; Horst Metzger, and Reif Werner, all of Ludwigshafen/Rhein, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Continuation of Ser. No. 505,229, Oct. 26, 1965, abandoned. This application Oct. 2, 1969, Ser. No. 863,770

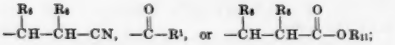
Int. Cl. C07c *121/78*

U.S. Cl. 260—465 D 1 Claim

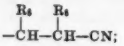
Production of carbonyl compounds substituted in the α-position and having the formula



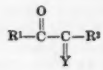
wherein R^1 is alkyl, aralkyl, phenyl, toluyl, naphthyl, alkoxy or amino; R_2 is hydrogen,



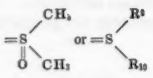
A is hydrogen, alkyl, halo or



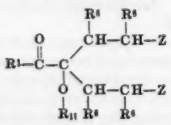
R^6 is hydrogen or methyl; and R^{11} is alkyl, wherein said compounds are formed by reacting a sulfur ylide having the formula



wherein Y is the radical



and R^9 and R^{10} are alkyl or phenyl, with a solution containing both an electrophilic agent A^1 that is converted into the radical A and a nucleophilic agent B^1 that is converted into the radical B; and said carbonyl compounds having the formula



wherein Z is nitrile, carboxyl, or carboxyl esterified with an alkanol.

3,821,278

OXIDATIVE DEHYDROGENATION OF PROPIONITRILE TO AERYLONITRILE

Werner O. Haag, and Joseph N. Miale, both of Trenton, N.J., assignors to Mobile Oil Company, New York, N.Y.

Filed Feb. 9, 1970, Ser. No. 10,022

Int. Cl. C07c *121/02, 121/32*

U.S. Cl. 260—465.9 1 Claim

Catalytic process for the oxidative dehydrogenation of paraffins (e.g., isobutane) or substituted paraffins (e.g., propionitrile) by reaction with carbonyl sulfide, at 300° – 700°C. in the presence of alumina or a Group II–A metal oxide to form the corresponding olefin (e.g., isobutene).

3,821,279

4-HYDROXYBUTYL, 6-HYDROXYHEXYL AND 8-HYDROXY- OCTYL PROSTAGLANDIN ESTERS

Masayasu Kurono, Osaka; Fusae Komoto, Kyoto; Takeshi Chiba, and Masaki Hayashi, both of Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd.

Filed Nov. 11, 1971, Ser. No. 197,930

Claims priority, application Japan, Dec. 7, 1970, 45-108291

Int. Cl. C07c *69/74*

U.S. Cl. 260—468 D 13 Claims

Prostaglandin esters are prepared by converting prostanoic acid into tertiary amine salts, reacting the salts with an alkylsulfonyl halide or phenylsulfonyl halide to form a mixed acid anhydride of carboxylic acid and sulphonic acid. The anhydride is then reacted with an alcohol to form prostaglandin esters.

3,821,280

DIHYDRO PGA1

Philip F. Beal, III, and John E. Pike, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 157,713, June 28, 1971, Pat. No. 3,759,965, Continuation-in-part of Ser. No. 82,121, Oct. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 480,107, Aug. 16, 1965, abandoned. This application Apr. 4, 1973, Ser. No. 347,785

Int. Cl. C07c *61/36, 69/74*

U.S. Cl. 260—468 D 6 Claims

This invention is a group of novel prostanoic acid derivatives, namely prostaglandin A_2 (PGA_2), prostaglandin A_3 (PGA_3), and 13,14-dihydroprostaglandin A_1 (13,14-dihydro-PGA_1), and the salts, esters, formates and alkanoates of those. These novel compounds are useful as antisecretory agents, vasodepressors, oxytocic agents, and abortifacients. These novel compounds are also useful to manage cases of renal disfunction and to regulate the menstrual cycle in women.

3,821,281

SULFONATO-BENZYL-MALONIC ACID ESTERS

Eduard Radlmann, and Gunther Nischk, both of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 18, 1973, Ser. No. 361,530

Claims priority, application Germany, May 20, 1972, 2224786

Int. Cl. C07c *143/52*

U.S. Cl. 260—470 1 Claim

Sulfonato-benzyl-malonic diesters as new compounds and a process for the preparation thereof by condensing of a malonic acid diester with a sulfonato-benzaldehyde and thereafter hydrogenating the reaction product thus obtained. The new compounds are useful as intermediate products and especially useful as comonomers for the synthetic resin and fiber industry.

3,821,282

POLYMERISABLE ANTHRANILIC ACID ESTERS

Johannes Blahak, Koeln; Erwin Muller; Ludwig Mott, both of Leverkusen, and Ernst Schwinum, Leichlingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 5, 1972, Ser. No. 241,459
Claims priority, application Germany, Apr. 7, 1971, 2116973
Int. Cl. C07c *01/54*
U.S. Cl. 260—471 R 1 Claim

Polymerisable anthranilic acid esters are obtained by heating acrylic or methacrylic acid esters containing hydroxyl groups with isatoic anhydride in an organic inert medium at temperatures of from 30° to 150°C in the presence of strong basis. They may be polymerised alone or in combination with other monomers by the methods of bulk solution suspension or emulsion polymerisation. Cross-linkage is possible even with the aid of polyisocyanates, formaldehyde and formaldehyde resins.

3,821,283

4-BENZYLIDENE-5-OXO-2-PHENYL-1-CYCLOPENTENEACETIC ACID AND ANALOG THEREOF

Leland J. Chinn, Morton Grove, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 6, 1973, Ser. No. 348,528
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 R 21 Claims

Preparation of 4-benzylidene-5-oxo-2-phenyl-1-cyclopenteneacetic acid and congeners, and valuable biological properties thereof including antibacterial activity, are disclosed.

3,821,284

ALKYL OXYBENZOIC ACID ESTERS

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner; Norbert Rigassi, both of Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Basel, all of Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed Mar. 30, 1970, Ser. No. 23,985
Claims priority, application Switzerland, Apr. 30, 1964, 6597/69
Int. Cl. C07c *8/92*
U.S. Cl. 260—473 R 26 Claims

Alkyl ethers or thioethers of benzene or benzyl derivatives wherein the alkyl radical contains a chain of six to 13 carbon atoms which are useful in killing and preventing the proliferation of insects by upsetting their hormone balance.

3,821,285

IODOETHYL ESTERS OF AROMATIC CARBOXYLIC ACIDS

Otto Rohr, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 29, 1972, Ser. No. 239,328
Claims priority, application Switzerland, Apr. 1, 1971, 4775/71
Int. Cl. C07c *69/78*
U.S. Cl. 260—476 R 2 Claims

Halogenethyl esters of aromatic carboxylic acids are useful ingredients to influence plant metabolism. They may be used preferably for regulating fruit abscission.

3,821,286

PROCESS FOR THE PRODUCTION OF METHYL METHACRYLATE

Venkatrao Krishnaraya Pai; Daniel Hyman, both of Fairfield, Conn., and John Maurice Witheford, Wycoff, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 5, 1971, Ser. No. 186,748
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 3 Claims

In the esterification of methacrylic acid by reaction with methanol in aqueous solution with sulfuric acid catalyst, the product stream from the esterification reactor is first separated into two immiscible liquid phases, an organic phase containing methyl methacrylate product and an aqueous phase containing the sulfuric acid. The aqueous phase from the first separation is mixed with an aqueous feed stream containing the reactant methacrylic acid. The sulfuric acid causes separation of two immiscible liquid phases consisting of an organic-rich phase containing methacrylic acid which is suitable for feed directly to the esterification reactor and a water-rich phase which contains the sulfuric acid. The water-rich phase is stripped of organics which are recycled and the sulfuric acid residue is concentrated by removing water and recycled to the reactor.

3,821,287

OXIDATIVE DEHYDROGENATION OF METHYL ISSBUTGRATE

Ulrich Bressel, Mannheim; Werner Fuchs, Ludwigshafen, and Rolf Platz, Mannheim, all of Germany, assignors to Badische Anilin- & Soda-fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Aug. 28, 1972, Ser. No. 283,986
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 D 1 Claim

In the oxidative dehydrogenation of organic compounds by means of free halogen, it is an advantage to obtain the free halogen as a result of ammonium halide splitting by bringing an aqueous ammonium halide solution into contact with a flame produced by burning hydrogen or combustible organic gases with oxygen or oxygen-containing gases.

3,821,288

16, 17-SECO-A-NOR STEROIDS

Pierre Crabbe, Mexico City, Mexico, and John H. Fried, Palo Alto, Canada, assignors to Syntex (U.S.G.) Inc., Palo Alto, Calif.

Filed July 1, 1971, Ser. No. 159,010
Int. Cl. C07c *49/45, 69/14, 69/24, 69/78, 69/74*
U.S. Cl. 260—488 B 10 Claims

New 16,17-seco-steroidal compounds of the A-nor estrane and androstane series, unsaturated at C-3, useful as antiandrogenic agents, and methods for their preparation.

3,821,289

TETRAHYDRONAPHTHYLALKANOIC ACIDS AND THEIR DERIVATIVES

Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Filed July 3, 1972, Ser. No. 268,718
Int. Cl. C07c *63/50*
U.S. Cl. 260—501.16 2 Claims

Novel tetrahydronaphthylalkanoic acids and their derivatives such as the alpha-(5,6,7,8-tetrahydro-4-chloro-2-naphthyl) propionic acid and its diethylamine salt, useful in the treatment of inflammation and associated pain and fever, are disclosed.

3,821,290

POLYFLUOROISOALKOXYALKYL SULFONIC ACIDS

Louis G. Anello, Orchard Park, and Richard F. Sweeney, Elma, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Mar. 1, 1971, Ser. No. 119,957
Int. Cl. C07c *143/02*
U.S. Cl. 260—513 R 6 Claims

Polyfluoroisoalkoxyalkyl sulfonic acids, which have a terminal polyfluorinated branched chain-or cyclic-perhaloisoalkoxy group linked through an ether oxygen to a perfluoromethylene substituent, and certain salt and acid halide derivatives thereof are useful as surface active agents, as emulsifying agents, as strong acid catalysts for organic reactions, as components of dry powder fire-extinguishing compositions, as oil- and water-repellent agents and as intermediates in the preparation of other polyfluoroisoalkoxyalkyl sulfonyl-substituted compounds.

3,821,291

5,6-TRANS PGB$_2$

Frank H. Lincoln, Jr., Portage, and John E. Pike, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 157,651, June 28, 1971, Pat. No. 3,759,978, which is a continuation-in-part of Ser. No. 72,511, Sept. 15, 1970, abandoned. This application Apr. 23, 1973, Ser. No. 353,481
Int. Cl. C07c *61/36, 69/74*
U.S. Cl. 260—514 D 6 Claims

5,6-Trans-prostaglandins E_2, $F_{2\alpha}$, $F_{2\beta}$, A_2, and B_2 are disclosed. These are useful for the same pharmacological purposes as the known prostaglandins PGE_2, $PGF_{2\alpha}$, $PGF_{2\beta}$, PGA_2, and PGB_2.

3,821,292

PROCESS FOR THE PREPARATION OF PURE SODIUM BENZOATE

Hans Leo Hulsmann, Wengern, and Gustav Renckhoff, Witten-Ruhr, both of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Feb. 18, 1971, Ser. No. 116,605
Claims priority, application Germany, Feb. 20, 1970, 2007783
Int. Cl. C07c *63/06*
U.S. Cl. 260—515 R 18 Claims

The present disclosure is directed to a process for the preparation of substantially pure sodium benzoate which comprises treating commercial grade methyl benzoate with acidic bleaching clay, of the montmorillonite type fractionally distilling the methyl benzoate to obtain a constant boiling-point, substantially pure fraction of methyl benzoate and saponifying the mixture with sodium hydroxide to obtain substantially pure sodium benzoate.

3,821,293

2-(4'-CHLORO-4-BIPHENYLYL)PROPIONIC ACID

Stewart Sanders Adams; Bernard John Armitage; John Stuart Nicholson, all of Nottingham, England, and Antonio Ribera Blancafort, Madrid, Spain, assignors to The Boots Company Limited, Nottingham, England

Continuation-in-part of Ser. No. 425,624, Jan. 14, 1965, abandoned. This application Dec. 15, 1969, Ser. No. 885,280
Int. Cl. C07c *63/00*
U.S. Cl. 260—515 A 1 Claim

2-(4'-Chloro-4-biphenylyl)propionic acid possessing valuable anti-inflammatory activity. It also exhibits analgesic and antipyretic properties.

3,821,294

PROCESS FOR PRODUCING VERY PURE TETRA CHLOROBISPHENOL A

Hugo Vernaleken, Krefeld; Ralf Lange; Hermann Schnell, both of Krefeld-Uerdingen, and Hans-Helmut Schwarz, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 28, 1971, Ser. No. 157,171
Claims priority, application Germany, June 29, 1970, 2032073
Int. Cl. C07c *65/02, 39/24, 39/16*
U.S. Cl. 260—520 5 Claims

Preparation of title product by cooling a hot solution of crude title product in acetic acid at a concentration of from 10–40 percent by weight and containing up to about 10 percent by weight of water to a temperature of about 55° to about 15°C. to produce a crystalline adduct of said product and acetic acid in a molar ratio of 1:2, separating said crystalline adduct from the mother liquor and decomposing said adduct into relatively pure tetrachlorobisphenol A and acetic acid.

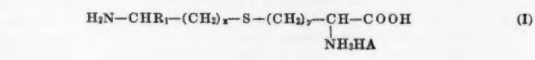
3,821,295

PROCESS FOR THE PRODUCTION OF α-AMINO-ACID HYDROHALIDES

Aaron David Ezekiel, Ilford, England, assignor to Ilford Limited, Essex, England

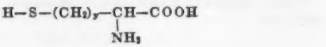
Continuation-in-part of Ser. No. 241,067, April 4, 1972, abandoned. This application Sept. 13, 1973, Ser. No. 396,775
Claims priority, application Great Britain, Apr. 19, 1971, 9813/71
Int. Cl. C07c *149/24*
U.S. Cl. 260—534 S 10 Claims

A process for the production of an α-amino-acid hydrohalide of the formula



(I)

wherein R_1 is a hydrogen atom or a methyl or ethyl group, A is Cl, Br or I, x is 0, 1 or 2 and y is an integer from 1 to 6 is described. A compound of the formula



or a hydrohalide salt thereof is reacted with a hydrohalide of a compound of the formula

$$H_2N-CHR_1-(CH_2)_x-halogen.$$

The reactants are brought together in an aqueous alkaline medium. The mixture is then acidified, a water-miscible organic solvent is added, the inorganic by-products are filtered off, an organic base is added and the compound of formula I is separated.

3,821,296

METHOD OF PRODUCING THE TRISODIUM SALT OF CARBOXY METHYLOXYSUCCINIC ACID

John H. Blumbergs, Highland Park, and Joseph H. Finley, Metuchen, both of N.J., assignors to FMC Corporation, New York, N.Y.

Filed Oct. 26, 1972, Ser. No. 301,161
Int. Cl. C07c *59/22*
U.S. Cl. 260—535 P 4 Claims

In the method of producing the trisodium salt of carboxymethyloxysuccinic acid by reacting in aqueous media maleic

acid and glucolic acid under basic conditions in the presence of calcium ions to produce the calcium salt of carboxymethyloxysuccinic acid and reacting the calcium salt with soda ash thereby forming a reaction mixture containing the trisodium salt and calcium carbonate, the improvement of increasing the filterability of the calcium carbonate to facilitate its separation from the reaction mixture comprising forming the trisodium salt of carboxymethyloxysuccinic acid by contacting simultaneously approximately stoichiometric amounts of the calcium salt and soda ash with a heel of preformed reaction mixture.

3,821,297

PURIFICATION OF PERFLUOROSULFONYL FLUORIDE PERFLUOROVINYL ETHERS BY THERMAL DECOMPOSITION OF UNSTABLE ISOMERS

Paul Raphael Resnick, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 44,111, June 8, 1970, abandoned. This application Aug. 18, 1972, Ser. No. 281,988

Int. Cl. C07g *143/08, 143/70*

U.S. Cl. 260—543 F **2 Claims**

The separation of primary perfluorosulfonyl fluoride perfluorovinyl ethers from their isomers by selective pyrolysis and the preparation of copolymers of tetrafluoroethylene from the purified isomers is disclosed.

3,821,298

VINYLATION OF ORGANIC COMPOUNDS

Norbert F. Cywinski, Odessa, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 620,649, March 6, 1967, abandoned, which is a division of Ser. No. 273,815, April 18, 1963, Pat. No. 3,372,198, which is a continuation-in-part of Ser. No. 150,648, Nov. 7, 1961, abandoned. This application May 6, 1970, Ser. No. 37,376

Int. Cl. C07c *103/30*

U.S. Cl. 260—561 R **11 Claims**

An alkyne is added to an amine or amide in the presence of a free radical initiator.

3,821,299

AMIDES AND IMIDES OF FLUORINATED ALKYLAMINES AND MALEIC AND OTHER ETHYLENICALLY UNSATURATED DIBASIC ACIDS AND POLYMERS THEREOF

Eduard Karl Kleiner, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 820,647, April 30, 1969, Pat. No. 3,658,843. This application Jan. 21, 1972, Ser. No. 219,822

Int. Cl. C07c *103/30*

U.S. Cl. 260—561 N **5 Claims**

Monomeric amides of fluorinated alkylamines and fumaric, maleic, citraconic, mesaconic and itaconic acids; and monomeric imides of such fluorinated alkylamines and maleic, citraconic and itaconic acids form homopolymers and copolymers with other ethylenically unsaturated comonomers. The polymers obtained have valuable soil repellent properties which are especially useful in textile finishes. Preferred compounds exemplified are N-1,1-dihydroperfluorooctylmaleimide and bis(N-1,1-dihydroperfluorooctyl)itaconamide.

3,821,300

CATALYTIC HYDRATION OF NITRILES TO PRODUCE AMIDES

Francis Clyde Rauch, and Guenter Willi Nachtigall, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 094,196, Dec. 1, 1970, Pat. No. 3,673,250. This application June 2, 1972, Ser. No. 259,172

Int. Cl. C07c *103/00*

U.S. Cl. 260—561 N **10 Claims**

A homogeneous catalyst system for catalytic hydration of nitriles with water to make the corresponding amide is described. The catalyst employs a diaryl or dialkyl phosphite in the solution of water and nitrile with a compound of a transition metal that is capable of forming a coordination complex with the phosphite. In specific embodiments diethyl or diphenyl phosphite and rhodium trichloride are used in a solution of acrylonitrile and water for catalytic hydration of the acrylonitrile to make acrylamide. Also described are similar catalyst systems and processes employing dialkyl or diaryl sulfites instead of the phosphite catalyst components.

3,821,301

SUBSTITUTED AMINOALKYL GUANIDINES

Karl Heinz Klingler, Langen, Germany, assignor to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

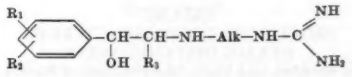
Filed Oct. 31, 1972, Ser. No. 302,411

Claims priority, application Austria, Nov. 8, 1971, 9606/71

Int. Cl. C07c *129/08*

U.S. Cl. 260—564 A **8 Claims**

Compounds are prepared of the formula:



where R_1 is hydrogen or hydroxy, R_2 is hydroxy, hydroxymethyl or alkyl of 1 to 6 carbon atoms, R_3 is hydrogen or alkyl of one to four carbon atoms and Alk is an alkylene group of two to six carbon atoms and their acid addition salts with pharmacologically acceptable acids. The compounds have high broncholytic activity and favorable circulatory effects.

3,821,302

OLEFINIC KETONE IMINES AND OIL COMPOSITIONS CONTAINING THEM

Shih-En Hu, Westfield, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 502,438, Oct. 22, 1965, abandoned. This application Aug. 1, 1969, Ser. No. 846,980

Int. Cl. C07c *119/00*

U.S. Cl. 260—566 R **6 Claims**

A multifunctional additive for an oil from the class consisting of gasoline, middle distillate petroleum fuels, mineral lubricating oils, and synthetic lubricating oils is prepared by reacting an aliphatic polyamine such as diethylene triamine, tetraethylene pentamine, and the like with an unsaturated ketone that has been prepared by the mild oxidation of a terminal olefin having from 12 to 250 carbon atoms. The reaction involves the formation of a Schiff base from the carbonyl group of the ketone and an amino group of the aliphatic polyamine. Modified products can be prepared by treating the unsaturated ketone with a sulfide of phosphorus, e.g., P_2S_5, or with a dihydrocarbyl dithiophosphoric acid prior to the step of reacting the ketone with the aliphatic polyamine.

3,821,303

IMPROVEMENTS IN OR RELATING TO THE MANUFACTURE OF CYCLOHEXANONE OXIME FROM CYCLOHEXANONE

Vaddadi Siva Bhaskar Rao; Kottil Wallapil Gopinath, and Madhur Srinivas Iyengar, all of Jorhat, India, assignors to Council of Scientific and Industrial Research, New Delhi, India

Filed July 12, 1972, Ser. No. 271,042
Int. Cl. C07c *131/04*
U.S. Cl. 260—566 A **3 Claims**

A process for manufacture of cyclohexanone-oxime from cyclohexanone and hydroxylamine in which the hydroxylamine required for the reaction is produced in situ by a reaction of sodium nitrite, zinc, ammonium chloride and carbon dioxide, whereby cyclohexanone is converted in one stage to the oxime without any prior isolation or purification of hydroxylamine.

3,821,304

BIS-(3,5-DI-TERTIARY BUTYL-4-HYDROXY-BENZYL)HYDROXYLAMINE

Peter Klemchuk, P.O. 148, Upland Rd., Yorktown Heights, N.Y. 10598

Division of Ser. No. 133,700, April 13, 1971, abandoned. This application Oct. 10, 1972, Ser. No. 296,449
Int. Cl. C07c *87/28*
U.S. Cl. 260—570.9 **1 Claim**

Substituted hydroxylamines exhibit activity as anti-oxidants for a diverse group of substrate materials under specific conditions of exposure to an oxidizing environment. Illustrative embodiments of substituted hydroxylamine anti-oxidants are bis(p-nitrobenzyl)hydroxylamine and 2-diethylamino-4,6,-bis(N-n-propyl-N-hydroxyamino)-s-triazine.

3,821,305

PROCESS FOR THE MANUFACTURE OF HEXAMETHYLENEDIAMINE

Gastone Bartalini, and Mario Giuggioli, both of Novara, Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed Oct. 22, 1970, Ser. No. 83,046
Claims priority, application Italy, Nov. 7, 1969, 53940/69
Int. Cl. C07c *85/12*
U.S. Cl. 260—583 K **2 Claims**

A process for the manufacture of hexamethylenediamine by the catalytic hydrogenation of adiponitrile, in liquid phase, at pressures from 20 to 50 atmospheres and temperatures from 60°to 100°C., in the presence of a finely divided Raney catalyst and caustic alkali; wherein hydrogen and adiponitrile are fed into a liquid reaction medium consisting of hexamethylenediamine, water, a caustic alkali and catalyst, in which medium the content of caustic alkali is maintained in the range of 0.2 to 12 moles per kilogram of catalyst, while the content of water is maintained in the range of 2 to 130 moles per 1 mole of caustic alkali.

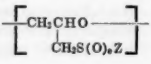
3,821,306

POLYETHERS HAVING OXIDIZED THIOETHER SIDE CHAINS

Hugh A. Farber, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

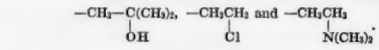
Filed Aug. 1, 1969, Ser. No. 846,949
Int. Cl. C07c *87/20*
U.S. Cl. 260—584 R **6 Claims**

Polyethers having utility as adhesion promoters for various polymers to metals and other substrates comprise repeating monomer units represented by the general formula:



wherein Z is $-CH{=}CR_1R_2$,
or

wherein G is hydroxyl, halogen or amine, R_1 and R_2 are individually hydrogen or a monovalent organic radical and e is 1 or 2. Exemplary of Z are $-CH{=}CH_2$,



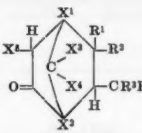
3,821,307

BICYCLIC KETONES HAVING BIOLOGICAL ACTIVITY

Paul E. Hoch, Moraga, Calif., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 714,058, Mar. 18, 1969, Pat. No. 3,661,998, which is a continuation-in-part of application Ser. No. 413,952, Nov. 24, 1964, abandoned.
Filed Apr. 30, 1971, Ser. No. 139,254
Int. Cl. C07c *49/27, 49/80*
U.S. Cl. 260—586 R **8 Claims**

Bicyclic ketones of the formula



wherein R^1, R^2, R^3, R^4, X^1, X^2, X^3, X^4 and X^5 are certain substituents selected from hydrogen, halogen, alkyl, alkenyl, halogenated alkyl, halogenated alkenyl, alkoxy, hydrocarbyl, halogen-substituted hydrocarbyl, carboxy, hydroxy-substituted alkyl, alkoxy-substituted alkyl, and hydroxy-substituted alkoxyalkyl, with at least two of X^1, X^2, X^3 and X^4 being halogen, and X^6 is halogen. The bicyclic ketones are made by treating a corresponding yricyclic hemiketal with phosphorus halide and hydrolyzing. The bicyclic ketones are useful as chemical intermediates and as insecticides.

3,821,308

DISUBSTITUTED NAPHTHALENONE COMPOUNDS

Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. Nos. 47,143, June 17, 1970, Pat. No. 3,714,195, which is a continuation-in-part of Ser. No. 708,498, Feb. 27, 1968, Pat. No. 3,565,958. This application Aug. 7, 1972, Ser. No. 278,508
Int. Cl. C07c *49/54*
U.S. Cl. 260—586 F **3 Claims**

This invention relates to substituted naphthalen compounds and their use in the synthesis of D-homosteroids. The latter compounds are useful as estrogenic agents in the treatment of laboratory and domestic animals.

3,821,309

PROCESS FOR PREPARING KETONES

John F. Knifton, Wappingers Falls, and Irving Schwager, Hopewell Junction, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 2, 1969, Ser. No. 881,634
Int. Cl. C07c *45/00*
U.S. Cl. 260—586 R **11 Claims**

This invention concerns the transformation of nitrated substrates, particularly nitroparaffins, to the corresponding

ketone using a homogenous metal catalyst such as ferrous salt, in the presence of an aqueous-inert solvent mixture, at moderately elevated temperatures.

3,821,310

1,3-BIS-(2'-HYDROXYBENZOYL)-BENZENES

Heimo Brunetti, Reinach; Hans-Jakob Peterli, Fullinsdorf; Helmut Muller, Binningen, and Hansjorg Heller, Riehen, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 878,870, Nov. 21, 1969, abandoned. This application Nov. 3, 1971, Ser. No. 195,493

Int. Cl. C07c *49/44*

U.S. Cl. 260—591 **8 Claims**

1,3-bis-(2'-hydroxybenzoyl)-benzenes are stabilizers of organic material. The compounds are obtained through dealkylating of the corresponding ethers.

3,821,311

PRODUCTION OF ALDEHYDES FROM OLEFINS

Oscar R. Hughes, Chatham Township, Morris County, and Melville E. D. Hillman, Gillette, both of N.J., assignors to Celanese Corporation, New York, N.Y.

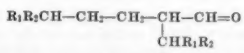
Filed May 21, 1970, Ser. No. 39,186

Int. Cl. C07c *45/08*

U.S. Cl. 260—604 HF **5 Claims**

Terminal olefins having the formula:

are transformed by a single-stage process into the product comprising saturated aldehydes having the formula:



and the corresponding alpha, beta-unsaturated aldehydes wherein R_1 and R_2 each independently represents a hydrogen substituent or a hydrocarbon substituent of between 1 and about 12 carbon atoms. The transformation is achieved by contacting the olefin conjointly with hydrogen, carbon monoxide, and a solution in a special hydroxylic organic solvent of a rhodium carbonyl complex, a triaryl phosphine, triaryl arsine, or triaryl stibine, and an aldol condensation catalyst.

3,821,312

ALKYLTHIO NITRODIPHENYL ETHERS

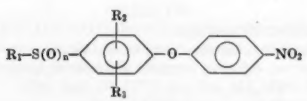
Yasunori Abe, 326-1 Futatsumiya, Omiya; Nobuo Yamane, 654 Azeyashi, Ageo-shi; Kensaku Itoh, 1090-Kamiochiai, Yono; Shuichi Ishida, 972, Hongo-cho, Omiya, and Hisabumi Kobayashi, 1039-Kamiochiai, Yono, all of Japan

Division of Ser. No. 143,187, May 13, 1971. This application Dec. 4, 1972, Ser. No. 311,746

Int. Cl. C07c *149/32, 147/00, 147/14*

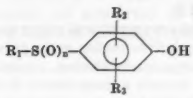
U.S. Cl. 260—609 F **3 Claims**

New compounds having the general formula



(I)

wherein R_1 represents a lower alkyl or allyl radical, R_2 represents a hydrogen or chlorine atom or a methyl radical, R_3 represents a hydrogen or chlorine atom, R_2 and R_3 may be identical or different and n is 0, 1 or 2; said compounds are manufactured by condensing phenol compounds having the general formula



(II)

(wherein R_1, R_2 and R_3 have the same meanings as mentioned above and n is 0, 1 or 2,) with *p*-chloronitrobenzene in the presence of an acid binding agent. Said new compounds have a selective and lasting herbicidal effect.

3,821,313

2-ALKYL-2-MERCAPTOMETHYL-1,3-PROPANE DIOLS

Helmut Reiff, Cologne-Flittard, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

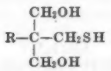
Filed Dec. 18, 1972, Ser. No. 316,313

Claims priority, application Germany, Dec. 22, 1971, 2163677

Int. Cl. C07c *149/18*

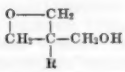
U.S. Cl. 260—609 R **3 Claims**

2-alkyl-2-mercaptomethyl-1,3-propane diols having the formula



wherein R is an optionally substituted alkyl radical

and are prepared by reacting 3-alkyl-3-hydroxymethyl oxetanes having the formula



with hydrogen sulphide under elevated pressure at temperatures of up to 300°C.

3,821,314

RECOVERY OF CYCLOHEXYLBENZENE HYDROPEROXIDE FROM REACTION MIXTURES

Alfred Arkell, Wappingers Falls; Raymond C. Schlicht, Fishkill, and Frederic C. McCoy, Beacon, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 9, 1972, Ser. No. 224,959

Int. Cl. C07c *73/00*

U.S. Cl. 260—610 A **8 Claims**

Separation of cyclohexylbenzene hydroperoxide from, for example, a mixture of cyclohexylbenzene and its oxidation products is accomplished by extraction of the oxidation products by means of polyurethane foam. Separation of the oxidation products is achieved in a two step desorption operation.

3,821,315

PREPARATION OF ETHERS

Stephen N. Massie, Palatine, and Herman S. Bloch, Skokie, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 22, 1972, Ser. No. 228,352

Int. Cl. C07c *41/06*

U.S. Cl. 260—612 D **9 Claims**

Symmetrical and unsymmetrical ethers may be prepared by the addition of alcohols to olefins in the presence of a catalyst comprising an organomolybdenum compound at reaction conditions which include a temperature in the range of from about 50° to about 300° C. and a pressure in the range of from about atmospheric to about 100 atmospheres.

3,821,316

FLAME RETARDING HOLOGENATED COMPOUNDS

Akira Taniuchi, Kyoto, and Takuji Nakano, Suita, both of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Division of Ser. No. 19,068, March 12, 1970, Pat. No. 3,660,318, Continuation-in-part of Ser. No. 764,307, Oct. 1, 1968, abandoned. This application Aug. 27, 1971, Ser. No. 175,692

Int. Cl. C07c *43/00*

U.S. Cl. 260—615 B **6 Claims**

Novel halogenides of a reaction product of a phenol, alcohol, fatty acid, thiophenol or mercaptane with a glycidyl ether, glycidyl ester or glycidyl thioether and, if necessary, an alkylene oxide or alkylene sulfide are excellent flame-retarding agents for polystyrene and a polystyrene composition containing said halogenated compound is self-extinguishable and resistant to weather and discoloration with lapse of time.

3,821,317

BISFLUORENOLS

Jimmy L. Webb, Jonesville, N.Y., and Walter L. Hall, Mount Vernon, Ind., assignors to General Electric Company, Schenectady, N.Y.

Filed May 26, 1971, Ser. No. 147,162

Int. Cl. C07c *39/12*

U.S. Cl. 260—619 B **4 Claims**

Bis(dibenzopyrans) prepared by reacting 2-phenylphenol and its higher homologues wherein the 6-position is substituted with a lower alkyl, including cycloalkyl, or phenyl, including lower alkyl substituted phenyl, substituent with bisketones are new chemical compounds. The bis(dibenzopyrans) are readily isomerized to the bisfluorenols. Since the latter compounds have two phenolic hydroxyl groups, they are useful in making polyesters, including polycarbonates, either as homopolymers or as copolymers with other dihydric phenols.

3,821,318

SECONDARY ALKENOLS PREPARED FROM ALUMINUM COMPOUNDS

Gottfried J. Brendel, and Lawrence H. Shepherd, Jr., both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 78,213, Oct. 5, 1970, Pat. No. 3,692,847, which is a division of Ser. No. 771,651, Oct. 29, 1968, Pat. No. 3,631,065. This application May 25, 1972, Ser. No. 257,049

Int. Cl. C07c *33/02*

U.S. Cl. 260—632 R **3 Claims**

Nonionic compounds in which an aluminum atom is part of an olefinically unsaturated ring system are prepared by causing interaction among aluminum, a conjugated diene and a hydrocarbon aluminum hydride in the presence of a suitable Lewis base such as 1,4-dioxane or N-methyl pyrrolidine. The resulting cyclic organo-aluminum compound is useful in the synthesis of olefins and branched chain alkenols. Thus by subjecting the cyclic organo-aluminum compound to hydrolysis, one or more olefins may be produced. To prepare branched chain alkenols, the cyclic organo-aluminum compound is reacted with a cleavable cycloparaffinic monether having a 3, 4 or 5 membered ring. Thereupon the reaction mixture is subjected to hydrolysis. The following novel compounds were prepared by this procedure:

1-chloromethyl-3,4-dimethyl-4-penten-1-ol
1-chloromethyl-3,3-dimethyl-4-penten-1-0l
2,2-bis(chloromethyl)4,5-dimethyl-5-hexen-1-ol
2,2-bis(chloromethyl)-4,4-dimethyl-5-hexen-1-ol
1,5,5-trimethyl-6-hepten-1-ol
1,5,6-trimethyl-6-hepten-1-ol
4,5,6-trimethyl-6-hepten-1-ol
2,2,3-trimethyl-5,5-bis(chloromethyl)tetrahydropyran

3,821,319

1,2-DIPHENYL-ETHANE DERIVATIVES

John Cameron Turner, Kent, and Rosalind Po-Kuen Chan, London, both of England, assignors to Biorex Laboratories Limited, London, England

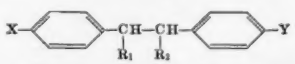
Filed Sept. 21, 1971, Ser. No. 182,525

Claims priority, application Great Britain, Sept. 29, 1970, 46242/70

Int. Cl. C07c *25/00*

U.S. Cl. 260–649 **2 Claims**

The present invention provides new 1,2-diphenyl-ethane derivatives of the general formula:



wherein R_1 and R_2, which may be the same or different, are alkyl radicals and X and Y, which may be the same or difrerent, are halogen atoms, with the proviso that when X and Y are both bromine or fluorine atoms, then R_1 and R_2 are not both methyl or ethyl radicals.

3,821,320

ARALKYLATION OF AROMATIC HYDROCARBONS

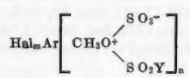
Victor Mark, Ransomville, and Leon R. Zengierski, North Tonawanda, both of N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 123,014, March 10, 1971. This application May 12, 1971, Ser. No. 142,813

Int. Cl. C07c *25/18*

U.S. Cl. 260—649 R **7 Claims**

Polyhalobenzylic disulfooxonium compounds of the type



in which

Ar is an aromatic nucleus,
Hal is fluorine, chlorine, bromine and iodine,
Y is fluorine, chlorine, bromine and hydroxyl,
n is 1–3, and
$n + m$ equals 6

react with aromatic hydrocarbons under mild reaction conditions to afford high yields of aralkylated derivatives useful as pesticides.

3,821,321

PROCESS FOR THE PREPARATION OF PENTAFLUOROMONOIODOETHANE

Karl-Heinz Hellberg, Hannover; Werner Rudolph, Anderten/Han, and Joach.n Massonne, Hannover, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed July 7, 1971, Ser. No. 165,850

Claims priority, application Germany, July 8, 1970, 2033755

Int. Cl. C07c 19/08

U.S. Cl. 260—653 10 Claims

Improved process for preparing pentafluoromonoiodoethane by reaction of tetrafluoroethylene with iodinepentafluoride and iodine in the presence of a metal halide as the catalyst, in a sealed reactor at 0°–120°C and wherein the tetrafluoroethylene, iodinepentafluoride and iodine are used in a mol ratio of at least 5:1:2, the improvement comprising carrying out the reaction in the presence of a halide of a metal of the IV or V SUB-group of the periodic system or of a mixture of such metal halides at a temperature between 20° and 100°C.

This invention relates to an improved process for preparing pentafluoromonoiodoethane.

3,821,322

POLYCYCLIC COMPOUNDS

Lawrence H. Shepherd, Jr., Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. Nos. 287,449, Sept. 8, 1972, abandoned, and Ser. No. 291,647, Sept. 25, 1972, said Ser. No. 287,449, Division of Ser. No. 888,071, and Ser. No. , said Ser. No. 291,647, Continuation-in-part of Ser. No. 888,071. This application Sept. 17, 1973, Ser. No. 398,172

Int. Cl. C07c 13/28

U.S. Cl. 260—666 PY 5 Claims

Tricyclo[4.2.1.$0^{2,5}$]nonanes having an allylic group in the 7 or 8 position and a methyl group in the 3 position may be made by reacting in a 1:2 ratio a bicycloheptadiene with a 2-alkenyl magnesium compound co-reactive therewith to effect intermolecular addition, and then hydrolyzing the addition product so formed. These substituted tricyclo[4.2.1.$0^{2,5}$]nonanes are useful, inter alia, as monomers for the manufacture of polymers and a raw material for the synthesis of lubricating oil additives and other useful products.

3,821,323

SELECTIVE HYDROGENATION OF MINOR AMOUNTS OF ACETYLENE IN A GAS MIXTURE CONTAINING MAJOR AMOUNTS OF ETHYLENE

Gerhard Schulze, Ludwigshafen; Artur Sliwka, Kirchheim, and Georg Wittmann, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Nov. 14, 1972, Ser. No. 306,288

Int. Cl. C07c 11/00

U.S. Cl. 260—677 H 7 Claims

Selective gas-phase hydrogenation of minor amounts of acetylene in a gas mixture containing major amounts of ethylene, using a palladium-on-silica gel catalyst which contains zinc.

3,821,324

OXIDATIVE DEHYDROGENATION PROCESSES

Brent J. Bertus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 19, 1972, Ser. No. 245,382

Int. Cl. C07c 5/18

U.S. Cl. 260—680 E 3 Claims

Organic compounds, particularly hydrocarbons, are oxidatively dehydrogenated to more unsaturated compounds by contact, under reaction conditions, with air, steam and a calcined solid catalyst composition comprising titanium, at least one component selected from the group consisting of tungsten or molybdenum, and at least one component selected from the group consisting of phosphorus, bismuth, lead, antimony or arsenic. Representative of such oxidative dehydrogenation processes is the conversion of butane to butenes and butadienes. Isopentenes are converted to isoprene using a catalyst comprising titanium, tungsten, bismuth and oxygen.

3,821,325

ORGANOPOLYSILOXANE-POLYCARBONATE BLOCK COPOLYMERS

Will D. Merritt, Jr., Lenox, Mass., and Jorgen H. Vestergaard, Mt. Vernon, Ind., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 23, 1973, Ser. No. 344,188

Int. Cl. C08g 47/10

U.S. Cl. 260—824 R 7 Claims

An improved process for the preparation of organopolysiloxane-polycarbonate block copolymers from halogen chain-stopped organopolysiloxane, dihydric phenol and phosgene is provided by reacting the halogen chain-stopped organopolysiloxane with dihydric phenol and using alkali metal hydroxide as the acid acceptor in the subsequent phosgenation which forms the final copolymer.

3,821,326

POLYCARBONATE-VINYLIDENE FLUORIDE HEXAFLUOROPROPYLENE COPOLYMER BLEND

Robert L. Lauchlan, Granger, Ind., and Hugh E. Snodgrass, Arcadia, Calif., assignors to Uniroyal, Inc., New York, N.Y.

Filed May 3, 1972, Ser. No. 249,860

Int. Cl. C08g 39/10

U.S. Cl. 260—873 6 Claims

Blends of polycarbonate resin with vinylidene fluoride-hexafluoropropylene copolymer are characterized by improved impact strengths, and especially by reduced notch width sensitivity.

3,821,327

BLENDS OF GRAFT COPOLYMERS CONTAINING AN ALKYL ACRYLATE-ALKYLTHIOALKYL METHACRYLATE BACKBONE WITH POLYVINYL CHLORIDE

Roy I. Yamamoto, Wappingers Falls; Carmen M. Cusano, Poughkeepsie, and Isaac D. Rubin, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 25, 1972, Ser. No. 300,545

Int. Cl. C08f 15/00, 15/40

U.S. Cl. 260—876 R 5 Claims

An ultraviolet light and fire resistant thermoplastic composition exhibiting good heat deflection temperature, tensile strength and elastic modulus properties comprising:

1. between about 50 and 75 wt. percent of a terpolymer resin characterized as a rubbery copolymer backbone of a C_2 to C_{18} alkyl acrylate and alkylthioalkyl methacrylate having grafted thereon an acrylonitrile-styrene member copolymer,
2. between about 50 and 25 wt. percent of a polyvinyl chloride having a specific viscosity between about 0.30 and 0.60 and,
3. between about 0 and 10 wt. percent of a syngeristic fire retarding metal salt, said graft terpolymer formed by polymerizing a mixture of said alkyl acrylate and alkylthioalkyl methacrylate under aqueous emulsion polymerization conditions at a pH between about 2–7 at a first temperature between about 110° and 150° C. under vigorous agitation conditions to form the rubbery copolymer of alkyl acrylate and ethylthioethyl methacry-

late, then second polymerizing within said polymerization conditions said polymer with a mixture of acrylonitrile and styrene member.

3,821,328
PROCESS FOR THE PRODUCTION OF COPOLYALKENAMERS

Roland Streck; Karl-Heinz Nordsiek; Heinrich Weber, and Klaus Meyer, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed June 22, 1972, Ser. No. 265,170
Claims priority, application Germany, June 24, 1971, 2131355
Int. Cl. C08f *29/02*
U.S. Cl. 260—884 **21 Claims**

Copolyalkenamers are produced by reacting a rubbery polybutadiene wherein more than 80 percent of the butadiene contact thereof is a 1,4-polymer, with a polyoctenamer or polydodecenamer or mixture thereof, in the presence of a mixed catalyst containing a compound of a metal of Subgroup 5 through 7 and a metal or a compound thereof of Main Group 1 through 4 of the Periodic Table.

3,821,329
GRAFT COPOLYMER ADDITIVES FOR VINYL CHLORIDE POLYMER COMPOSITIONS

Ruth Gallagher, Dobbs Ferry, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 28,897. This application Aug. 19, 1971, Ser. No. 165,804
U.S. Cl. 260—885 **9 Claims**

Novel additives comprising graft copolymers of a methyl methacrylate polymer onto copolymers of lower alkyl acrylates with either benzyl acrylate or vinylidene chloride are disclosed. It is further shown that these additives provide excellent results in the preparation of clear, impact resistant, thermoplastic compositions which comprise blends of the aforedescribed additives with a homo- or copolymer of vinyl chloride.

3,821,330
CONTINUOUS POLYMERIZATION OF ACRYLICS

Kevin W. Free, New Castle, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 887,132. This application Mar. 3, 1972, Ser. No. 231,748
Int. Cl. C08f *15/00*
U.S. Cl. 260—885 **7 Claims**

Continuous production of acrylic polymers by bulk polymerization of a portion of the acrylic monomers passing through an adiabatic reaction zone, recycling at least 55 percent of the reaction product, separating from the unrecycled portion of the reaction product acrylic polymer.

3,821,331
COPOLYMERS OF PIVAOLACTONE AND ISOPRENE OR BUTADIENE

Robert Paul Foss, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 227,258. This application Jan. 17, 1973, Ser. No. 324,502
Int. Cl. C08d *9/08*
U.S. Cl. 260—887 **9 Claims**

Disclosed herein are new, specifically modified, copolymers of pivalolactone with isoprene and/or butadiene. Also disclosed is a process for making copolymers comprising (1) polymerizing the diene with a lithium initiator and, optionally, metallating the resulting lithiopolydiene with an alkyllithium, (2) corboxylating the resulting polylithiopolydiene by reaction with carbon dioxide, (3) reacting the polymeric lithium carboxylate with tetraalkylammonium hydroxide or halide and (4) reacting the tetraalkylammonium salt with pivalolactone.

3,821,332
EXTRA HIGH MOLECULAR WEIGHT PARTICLE FORM POLYETHYLENE-POLYISOBUTYLENE BLEND

Eli Solop, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 877,835. This application Sept. 13, 1971, Ser. No. 180,224The portion of the term of this patent subsequent to July 25, 1978, has been disclaimed.
Int. Cl. C08f *29/12*
U.S. Cl. 260—897 A **6 Claims**

Extra high molecular weight particle form polyethylene-polyisobutylene blends are produced wherein the two components are present in the weight percent ranges of 70–85 percent and 30–15 percent, respectively, and the attendant physical properties render said blends particularly adaptable to the manufacture of films.

3,821,333
GASKET FOR LENS MOLD FROM A BLEND OF EPDM AND ETHYLENE/VINYL ACETATE COPOLYMER

Bertram R. Goodwin, Feeding Hills, and Don H. Rotenberg, Westboro, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Mar. 21, 1973, Ser. No. 343,615
Int. Cl. C08f *37/18*
U.S. Cl. 260—897 B **10 Claims**

A "T" gasket for lens molds, formed of a mixture of ethylene copolymers such as poly(ethylene-vinyl acetate) and poly(ethylene-propylene-diene) with no plasticizers, additives, or release agents required for its use.

3,821,334
PROCESS FOR THE MANUFACTURE OF P-HYDROXYBENZYL COMPOUNDS

Andreas Schmidt, and Heimo Brunetti, both of Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 23, 1972, Ser. No. 237,526
Claims priority, application Switzerland, Apr. 8, 1971, 5230/71
Int. Cl. G07f *9/28*
U.S. Cl. 260—932 **5 Claims**

p-Hydroxybenzyl compounds are prepared by reacting a p-hydroxybenzyl ester of a dithiocarbamic acid with a corresponding compound having an active hydrogen in the presence of a base. The prepared compounds are stabilizers.

3,821,335
AMINOMETHYLPHOSPHONATES

Morton Lewis, Elmhurst, Ill., assignor to Swift & Company, Chicago, Ill.

Filed Feb. 4, 1971, Ser. No. 112,786
Int. Cl. C07f *9/40;* **A01n** *9/36*
U.S. Cl. 260—945 **6 Claims**

Halogen-containing hydrocarbons are formed by treating certain condensation products with a protolytic agent. The condensation products are halogen-containing materials produced by halogenating the product resulting from the condensation of a primary or secondary amine, an aliphatic acid phosphite and an alpha-beta or beta-gamma unsaturated carbonyl source. The halogen-containing hydrocarbons are useful as fumigants with the volatile ones being especially useful as soil fumigants.

3,821,336

2,3-DIBROMOPROPYL METHYL ACID PHOSPHATE

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 26,050, Apr. 6, 1970, Pat. No. 3,666,712, which is a continuation-in-part of Ser. No. 463, Jan. 2, 1970, abandoned. This application Sept. 27, 1971, Ser. No. 184,309 1971, Ser. No. 184,309

Int. Cl. C07f 9/08; C08f 45/58

U.S. Cl. 260—963 1 Claim

Self-extinguishing homo- and copolymers of methyl methacrylate (MMA) are prepared by the intimate admixture of the latter polymers with a specified 2,3-dibromopropyl acid phosphate ester. The thus treated polymers display a high degree of flame retardance without any diminution of their clarity or hardness and they may be safely employed in any application requiring their possible exposure to fire.

3,821,337

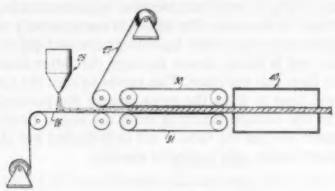
PROCESS FOR CONTROLLED CURING OF FOAMS

Edward J. Bunclark, Dollard des Ormeaux; Warrington C. Harrison, Beaconsfield, both of Canada, and Eric O. Forster, Scotch Plains, N.J., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed May 7, 1973, Ser. No. 357,730

Int. Cl. B29c 6/04

U.S. Cl. 264—26 6 Claims



A process for preparing a foamed phenol-aldehyde insulating board is provided in which a foamable resole resin having less than 15 wt. percent water is mixed with boric anhydride and then foamed and cured at a foam temperature above about 55° C. Thereafter the foamed resin is heated by microwave energy thereby postcuring the foamed resin board.

3,821,338

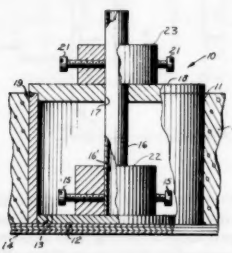
SLEEVE PROTECTOR

Fred W. Faust, 1828 Farnsley Rd., Louisville, Ky. 40216

Filed June 15, 1972, Ser. No. 263,008

Int. Cl. E04c 1/06

U.S. Cl. 264—35 6 Claims



A protector device. This device consists primarily of a flanged bottom plate nailed to a plywood deck, a large diameter sleeve within concrete, an upper plate and a multiple number of set screws for securing a pipe.

3,821,339

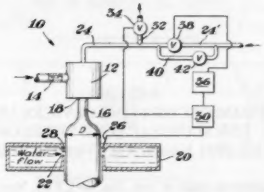
FILM SIZE CONTROL APPARATUS AND METHOD

Floyd C. Johnson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 19, 1972, Ser. No. 264,705

Int. Cl. B29d 7/22, 23/04

U.S. Cl. 264—40 10 Claims



A system of controlling the size of inflated, tubularly extruded film is taught based on a principle of monitoring the height of a meniscus formed by a quenching liquid applied circumferentially to cool the film, and which varies responsive to changes in diameter of the film. The system in its optimum form contemplates a continuous flow of inflating gas into the film, balanced with cyclic withdrawals of gas therefrom responsive to the detected height of the meniscus, such balance being sufficient to control the film under generally static operating conditions. In the event of erratic operating conditions, such as the sudden loss of gas pressure through pinholes or breaks in the film, the same is automatically detected by the resulting behavior of the meniscus, and replenishing gas in relatively large amounts is controllably injected into the film to quickly reestablish the proper size thereof. The system operates without contacting or in any way disturbing or marring the film.

3,821,340

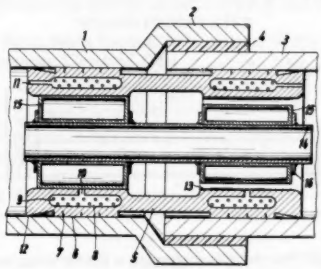
METHOD AND APPARATUS FOR SEALING PIPE SECTIONS

Helmuth Marks, Berlin, Germany, assignor to Wilhelm Fischer, Berlin, Germany, a part interest

Filed May 19, 1972, Ser. No. 255,190

Int. Cl. B29d 23/00; F16j 15/04; F16l 21/02

U.S. Cl. 264—45 6 Claims



A sealing sleeve for sealing between adjacent pipe ends, comprises a resilient member having two annular external surfaces one to be disposed in sealing contact in each pipe end. The sealing sleeve has an annular cavity therein adjacent each of the two annular surfaces, each cavity having a first opening that extends radially inwardly and a second opening that extends endwise axially. Each cavity contains a reinforcing element. In use, the sleeve is inserted in the adjacent pipe ends,

and a foaming plastic cement that expands upon hardening is inserted through the first opening until it comes out the second opening. A pipe with inflatable collars having the same spacing as the cavities is then inserted in the sleeve and the collars are inflated into sealing contact with the internal surfaces of the sleeve adjacent the cavities, until the inserted material is hardened, after which the collars are deflated and the pipe is removed.

3,821,341

MOLDED FOAM DECORATIVE DEVICES AND PROCESS FOR MANUFACTURE THEREOF

Russell F. Tull, 2081 Kendal Ave., Victoria, British Columbia, Canada

Continuation-in-part of Ser. No. 595,513, Nov. 19, 1966, abandoned, and a continuation of Ser. No. 808,099, March 18, 1969, abandoned. This application Nov. 1, 1971, Ser. No. 194,710

Int. Cl. B29d *9/00*

U.S. Cl. 264—51 **5 Claims**

A decorative device for application to a surface to be decorated and a method for making same. The device is made of an expanded plastic material having a decorative surface and a supporting surface. The decorative surface is of greater density and smoother than the supporting surface. The greater density and smoothness of the decorative surface is provided by the method of forming.

In one form of the invention the decorative device is molded in the desired form, the mold producing a relatively dense decorative surface, whereas the supporting surface is relatively open pored.

3,821,342

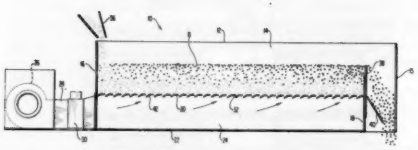
METHOD FOR EXPANDING SYNTHETIC PLASTIC BEADS IN A FLUID BED

Stanley E. Hurd, Sunnyvale, Calif., assignor to The Motch & Merryweather Machinery Company, Euclid, Ohio

Continuation of Ser. No. 102,277, Dec. 29, 1970, abandoned. This application Aug. 8, 1972, Ser. No. 278,840

Int. Cl. B29c *25/00;* **B29d** *27/00*

U.S. Cl. 264—53 **6 Claims**



The fluid bed includes a plenum, a slotted plate overlying the plenum, and a chamber above the plate. Raw unexpanded beads are disposed in the chamber at one end thereof. Heated air is supplied the plenum and issues through the slots in the form of air jets having predominantly longitudinally directed flow components for distributing the raw beads along the plate and exposing the beads substantially uniformly to the heated air. The beads are fluidized by the heated air and expand due to the heating of the blowing agent impregnated in the beads. The expanded beads are carried to the top of the chamber by the fluidizing air and are discharged over an adjustable gate at the opposite end of the chamber.

3,821,343

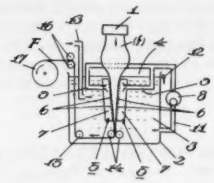
MANUFACTURING METHOD OF THERMOPLASTIC SYNTHETIC RESIN FILMS

Michio Sudo, Tokyo, Japan, assignor to Mitsubishi Yuka Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 32,585, April 17, 1970, abandoned, which is a division of Ser. No. 724,795, April 29, 1968, Pat. No. 3,543,334. This application June 27, 1972, Ser. No. 264,750

Int. Cl. B29c *17/07*

U.S. Cl. 264—89 **14 Claims**



A hollow tube of thin thermoplastic film is extruded in downward direction and expanded to a desired cross-section. Immediately after this expansion the tube is guided into a liquid bath and along a perforate element which extends in direction of travel of the tube. The liquid in continuously circulated along the interface of the travelling tube and the perforate element and is being drawn through the latter in the direction away from this interface. This serves to cool the tube and at the same time to draw the same against the perforate element due to the suction resulting from the liquid passing through the same, so that the tube is not only cooled but also supported against and by said perforate element.

3,821,344

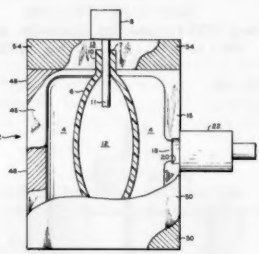
METHOD FOR BLOW MOLDING ARTICLES HAVING A PLURALITY OF OPENINGS

Donald L. Peters, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 18, 1972, Ser. No. 272,962

Int. Cl. B29c *17/07, 17/14*

U.S. Cl. 264—94 **4 Claims**

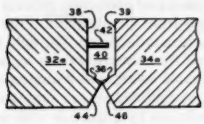


A method for blow molding a hollow article having a plurality of openings thereinto includes inserting a parison into a cavity in a multi-part mold, injecting fluid into the mold-contained parison for expanding the parison outwardly, and intermittently and independently moving a sleeve slidably mounted within a passage through the wall of the mold and a mandrel positioned within the sleeve to perforate the parison wall and to move the mandrel through the perforation to form an opening defined by a neck in the expanded parison.

3,821,345
METHOD OF SEALING AND BLOW MOLDING TUBULAR PARISONS UTILIZING ALTERNATE PROJECTIONS IN A SEALING MEMBER

Dixie E. Gilbert, Pomona, N.Y., assignor to Philips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 103,380, Jan. 4, 1971, Pat. No. 3,687,593. This application May 18, 1972, Ser. No. 254,741
Int. Cl. B29c *17/07*
U.S. Cl. 264—98 6 Claims

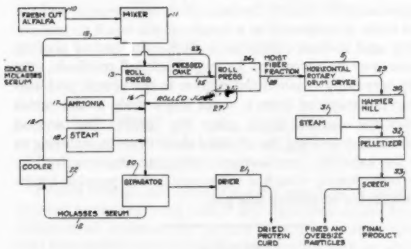


A method of blow molding open end tubular parisons. A parison is heated to orientation temperature, stretched longitudinally, and placed in a molding zone. One end of the parison is flattened to seal and form a tab in the end thereof and small gripping means are simultaneously embedded in the tab in alternate arrangement from both sides thereof. The parison is sheared adjacent the tab, which remains as part of the final product, and the parison is blow molded while the sealed parison is restrained from separating with the gripping means.

3,821,346
PET LITTER PRODUCED BY RECYCLED MOLASSES SERUM

William R. Batley, Jr., Brawley, Calif., assignor to William R. Batley, Jr., Brawley, Calif.

Continuation-in-part of Ser. No. 167,901, Aug. 2, 1971, Pat. No. 3,775,133. This application Feb. 16, 1972, Ser. No. 226,831 The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.
Int. Cl. A23k *1/02*
U.S. Cl. 264—115 10 Claims

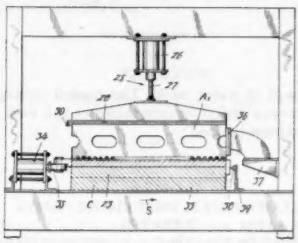


An improved pet litter is disclosed which has as its major ingredient the fiber fraction of alfalfa or other leafy green vegetable fibers. The new litter is prepared by squeezing chopped leafy green crops in the presence of water, ammoniated water or ammoniated serum derived from the rolled juice. The resulting pressed cake is then subjected to a low temperature drying operation followed by procedures to produce a pelletized absorbent fibrous material.

3,821,347
PROCESS FOR PRODUCING A STRUCTURAL CONCRETE BLOCK

Reichi Katoh, No. 12-5 Gakuenhigashi-cho, Kadaira-City, Tokyo, Japan

Filed Feb. 15, 1973, Ser. No. 332,753
Claims priority, application Japan, Oct. 19, 1972, 47-103944; Oct. 23, 1972, 47-105332
Int. Cl. B28b *11/12, 11/18*
U.S. Cl. 264—162 2 Claims



A process for producing a structural concrete block in which a preformed concrete block blank having alternate grooves and projections on one major surface thereof is fed to a predetermined position by intermittently driven conveying means, the conveying means is stopped to allow the blank to remain in the predetermined position and simultaneously, the blank is transferred to a guide member by a transfer mechanism, the conveying means is driven to feed a second similar concrete block blank, the conveying means is stopped and simultaneously, the transfer mechanisms transfers the second blank to the guide member so as to transfer the first blank to a cutting station in which a cutting blade having teeth on one surface for engaging the grooves in the blank is disposed and the blade is moved relative to the first blank to cut off the projections on the blank.

3,821,348
PROCESS FOR RECOVERING NITRILE POLYMER SOLIDS FROM LATEX

Paul E. Planz, North Randall, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 25, 1972, Ser. No. 229,508
Int. Cl. D01f *7/00*
U.S. Cl. 264—182 2 Claims

Nitrile polymer solids, such as an acrylonitrile-methyl acrylate copolymer prepared in emulsion in the presence of a diene rubber, are recovered from the latex by mechanical shearing of the latex to form a paste followed by shaping and contacting the shaped paste with a hot water medium.

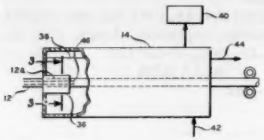
3,821,349
INTERNAL COOLING OF POLYETHYLENE TEREPHTHALATE TUBING

Larry P. Mozer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 15, 1972, Ser. No. 263,223
Int. Cl. B29c *17/07*; B29d *23/04*
U.S. Cl. 264—209 7 Claims

Relatively heavy wall, clear polyethylene terephthalate tubing is prepared by extruding a tubular melt into contact with an external sizing and cooling surface while simultaneously cooling the inner surfaces by means of a mandrel within the

tubing spaced apart from the inner walls thereof by a narrow annular gap. Upon exiting from the sizing sleeve, the tubing is



passed through a water bath. The cooled tubing can be severed into open ended parison preforms and such preforms reheated and blow molded.

3,821,350

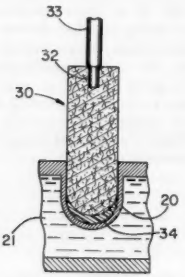
METHOD OF COATING A TAMPON WITH AN INSERTION AID

David V. Suchane, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 165,134, July 22, 1971, Pat. No. 3,724,465. This application Nov. 17, 1972, Ser. No. 307,588

Int. Cl. B29h *9/02*

U.S. Cl. 264—257 **7 Claims**



A method for applying a normally solid lubricant to the tip of a precompressed tampon. The solid lubricant is first melted to a fluid state, then formed into a bead. A portion of the bead surface is congealed and the bead then molded around the tampon tip and solidified.

3,821,351

SOLVENT EXTRACTION OF METAL IONS USING N-SUBSTITUTED HYDROXAMIC ACIDS

Michael Francis Lucid, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 149,762, June 3, 1971, abandoned. This application Sept. 18, 1972, Ser. No. 289,875

Int. Cl. C02b *1/48*

U.S. Cl. 423—9 **16 Claims**

This invention relates to the recovery of metal ions from an aqueous medium and in particular to a solvent extraction process employing certain N-substituted hydroxamic acids as extractants.

3,821,352

PROCESS FOR SEPARATION OF YTTRIUM FROM THE LANTHANIDES

Bjorn Gaudernack, Oslo; Gunnar Hannestad, and Ingleiv Hundere, both of Skedsmokorset, all of Norway, assignors to Forskningsgruppe for Sjeldne Jordarter, Oslo, Norway

Continuation-in-part of Ser. No. 180,097, Sept. 13, 1971. This application Jan. 26, 1973, Ser. No. 326,973

Claims priority, application Norway, July 20, 1971, 2750/71The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.

Int. Cl. C22b *59/00*

U.S. Cl. 423—21 **8 Claims**

An improved liquid-liquid extraction process for the separation of yttrium values from the elements of the lanthanide series and other impurities is disclosed. The light lanthanide elements are separated by extraction from an aqueous nitrate solution with an organic solution of a quaternary ammonium nitrate, and the heavy lanthanides are subsequently removed from the aqueous solution by extraction with an organic solution of a quaternary ammonium thiocyanate.

3,821,353

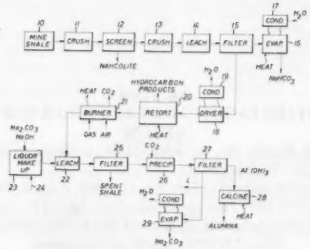
SHALE OIL AND MINERAL RECOVERY PROCESS

Bernard E. Weichman, Houston, Tex., assignor to The Superior Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 726,950, May 6, 1968, abandoned. This application Oct. 12, 1970, Ser. No. 79,823

Int. Cl. C01f *7/08, 7/06*

U.S. Cl. 423—119 **25 Claims**



Integrated processes are disclosed for recovering hydrocarbon products as well as alumina and sodium carbonate and/or nahcolite from oil shale. The shale is pyrolized or retorted at low temperature to recover hydrocarbon compounds, and the retorted shale is subjected to a weak caustic leach to remove aluminum and sodium compounds. Nahcolite and/or sodium carbonate may be recovered by two disclosed methods, one being by screening crushed shale prior to the retort, and also removing the material from a water leach prior to the retort and from the caustic leach after the retort. The second method includes heating the crushed shale prior to retorting to change the nahcolite into sodium carbonate characterized by a lower bulk density which is separated out to provide a substance useful for scrubbing flue gas.

3,821,354

METHOD FOR SELECTIVELY ABSTRACTING NICKEL FROM AN AQUEOUS AMMONIACAL SOLUTION

Louis Gandon, and Marie Goulaouic, both of Le Havre, France, assignors to Le Nickel, Paris, France

Filed Mar. 28, 1972, Ser. No. 238,775

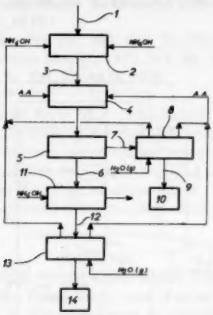
Claims priority, application France, Mar. 29, 1971, 71.10922

Int. Cl. C01g *53/00;* **C22b** *23/04;* **C01g** *53/12*

U.S. Cl. 423—139 **6 Claims**

Nickel is recovered from an aqueous solution containing salts of nickel, cobalt, and various other metals by a process

comprising adjusting the amount of ammonium ions in the solution so that all of the nickel present in the solution is in the form of its hexamine complex and all the cobalt present is in



the form of its pentamine complex; contacting the solution with acetyl acetone until a nickel precipitate is formed; and thereafter recovering the nickel values from the precipitate.

3,821,355

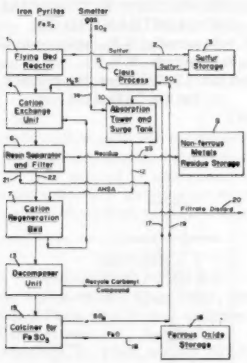
RECOVERY OF SULFUR AND METAL VALUES FROM SULFUR BEARING MINERALS

Bhaskar Bandyopadhyay, Camillus, N.Y.; Charles P. Bruen, Bernardsville, N.J., and Christian A. Wamser, Camillus, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 8, 1972, Ser. No. 251,634

Int. Cl. B01g *1/04*; **C01b** *17/52, 17/02*

U.S. Cl. 423—139 **11 Claims**



Pyrites tailings and smelter gas, by-products of smelters, are treated to recover iron values and elemental sulfur by a combination of: roasting the pyrites to produce elemental sulfur and iron sulfide; converting the iron sulfide with an acid cation exchange resin to liberate H_2S and adsorb ferrous iron; reacting the smelter SO_2 gas with a carbonyl compound to produce alpha hydroxy sulfonic acid; adding the a-hydroxy sulfonic acid to the cation exchange resin containing iron to regenerate the cation exchange resin, and recycling; heating the ferrous hydroxy sulfonate formed, to produce ferrous sulfite and liberate the carbonyl compound; calcining the ferrous sulfite to liberate SO_2, producing by-product ferrous oxide, and reacting the liberated SO_2 with the liberated H_2S to produce elemental sulfur.

3,821,356

PRODUCTION OF HIGH PURITY HALIDES

Willis H. Baldwin, Erie, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Mar. 8, 1973, Ser. No. 339,488

Int. Cl. C01q *56/00*; **C01g** *43/00*; **C01b** *9/00*

U.S. Cl. 423—250 **4 Claims**

A single-step process for the conversion of lanthanide or actinide oxides by taking advantage of the halogenating and solvent capacity of selected amine hydrohalides is described. The process can be conducted in a single reaction vessel with a minimum of manipulations.

ERRATUM

For Class 423—275 see:
Patent No. 3,821,044

3,821,357

COMPLEX ALUMINUM PHOSPHATES

John Edward Cassidy, and Philip Glenn Millar, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 18, 1972, Ser. No. 245,196

Claims priority, application Great Britain, Apr. 28, 1971, 11880/71

Int. Cl. C01b *25/10*

U.S. Cl. 423—300 **9 Claims**

Complex halogen-containing aluminum phosphates are prepared by contacting aluminum orthophosphate hydrate with hydrogen chloride, bromide or iodide. The complexes produced are useful as refractory binders.

3,821,358

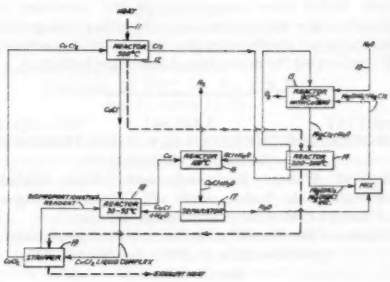
CLOSED-CYCLE THERMOCHEMICAL PRODUCTION OF HYDROGEN AND OXYGEN

Leonard V. Interrante, Schenectady, and Robert H. Wentorf, Jr., both of Schenectady, N.Y., assignors to General Electric Company, N.Y.

Filed Feb. 1, 1973, Ser. No. 328,527

Int. Cl. C01b *13/00, 1/02*

U.S. Cl. 423—579 **7 Claims**



A process is disclosed for the multi-step closed-cycle thermochemical production of hydrogen and oxygen. Water is split into hydrogen and oxygen at separate stations by the use of copper compounds circulating in a sub-cycle, magnesium compound circulating in a sub-cycle and chlorine generated in the copper sub-cycle.

3,821,359

TITANIUM DIOXIDE PIGMENTS

Joseph Earle Lewis, Jr., Brighton, England, and George Leathwhite Roberts, Jr., Lynchburg, Va., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 849,280, Aug. 5, 1969, abandoned, which is a continuation of Ser. No. 662,595, Aug. 23, 1967, abandoned. This application July 30, 1970, Ser. No. 64,120

Int. Cl. C01g *23/04, 23/08*

U.S. Cl. 423—610 **7 Claims**

This invention relates to the preparation of titanium dioxide pigment and has as its principal object the production of titanium dioxide pigment of improved tinting strength and tint tone. In particular, the present invention relates to a process for the preparation of TiO_2 in pigmentary form which comprises forming a slurry of particulate TiO_2 in hydrofluoric acid, allowing the slurry to stand until at least some of the slurried solids have been dissolved, and thereafter recovering the resulting titanium dioxide pigment of reduced particle size, improved tinting strength and bluer tint tone.

3,821,360

PREPARATION OF NON-SOLVATED ALUMINUM HYDRIDE

Theodore C. Kraus, Cheshire; James A. Scruggs, West Haven, and Samuel I. Trotz, Mount Carmel, all of Conn., assignors to Olin Mathieson Chemical Corporation, New Haven, Conn.

Filed Mar. 2, 1962, Ser. No. 177,704

Int. Cl. C01b *6/00*

U.S. Cl. 423—645 **7 Claims**

1. A method for the preparation of non-solvated aluminum hydride which comprises (A) reacting a compound selected from the group consisting of mercuric chloride, mercurous chloride, ferric chloride, zinc chloride, cupric chloride and cuprous chloride with an excess of an alkali metal aluminum hydride of the formula:

$MA1H_4$, wherein M is an alkali metal selected from the group consisting of lithium, sodium and potassium and in the presence of a lower dialkyl ether of the formula:

R_1OR_2, wherein R_1 and R_2 are alkyl radicals having from one to five carbons atoms, the molar ratio of the said compound reacted with the said alkali metal aluminum hydride being within the range of from about 0.49 to about 0.17, (B) separating liquid and solid phases of the resulting reaction mixture, (C) recovering from the liquid phase a solvated aluminum hydride product containing the unreacted alkali metal aluminum hydride, (D) heating the said solvated aluminum hydride product at a temperature of from about 20°C. to about 150°C. and for a period of time sufficient to remove the lower dialkyl ether associated with the aluminum hydride whereby a non-solvated aluminum hydride product containing the unreacted alkali metal aluminum hydride is obtained and (E) recovering the non-solvated aluminum hydride.

3,821,361

PROCESS FOR THE RECOVERY OF DEUTERIUM FROM HYDROGEN-RICH GAS

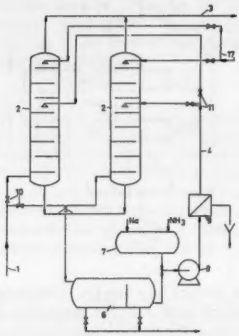
Siegfried Walter, Dortmund, and Ulrich Schindewolf, Friedrichstal, Baden, both of Germany, assignors to Friedrich Uhde GmbH, Dortmund, Germany

Division of Ser. No. 887,638, Dec. 23, 1969, abandoned. This application June 30, 1971, Ser. No. 158,241

Int. Cl. C01b *1/00*

U.S. Cl. 423—648 **2 Claims**

A process for the recovery of deuterium from a gas having deuterium values and oxygen bearing impurities by contacting the gas with a solution of sodium or lithium in ammonia to eliminate oxygen-bearing impurities as sparingly soluble reaction products. The NH_3-Na or Li solution contacts the synthesis gas saturated with NH_3 having oxygen impurities and deuterium values therein and the deuterium rich ammonia gases from a deuterium enrichment unit in order to achieve saturation of higher deuterium concentration. The ammonia gases saturated with deuterium values are finally passed on to the deuterium enrichment unit to recover deuterium values and to produce ammonia depleted of deuterium. The preparation



and/or stock tank for the Na -or Li- solution in NH_3 is provided with a lining material selected from the group consisting of copper, non-ferrous metal and plastics because the NH_3-Na solution resides in these containers for an extended period of time.

3,821,362

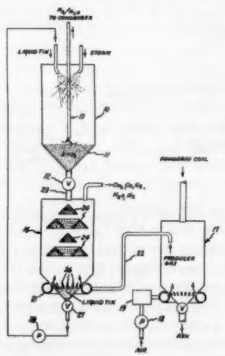
HYDROGEN PRODUCTION BY DISSOCIATION OF STEAM WITH LIQUID TIN

Henry S. Spacil, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 13, 1972, Ser. No. 217,514

Int. Cl. C01b *1/08*

U.S. Cl. 423—657 **5 Claims**



A process is described for the dissociation of steam by liquid tin to form hydrogen gas and solid tin dioxide. The wet hydrogen gas is collected and dried and the tin dioxide is subjected to reduction to form liquid tin that is then recycled.

3,821,363

SUNSCREEN PREPARATION EMPLOYING ETHYLENE-MALEIC ANHYDRIDE COPOLYMERS

Archie Scott Black, 1323 Broadmoor St., Memphis, Tenn. 38111, and Wolffe Harry Feinstone, 3022 Jackson Ave., Memphis, Tenn. 38103

Continuation of Ser. No. 587,968, Oct. 20, 1966, abandoned. This application Jan. 21, 1971, Ser. No. 108,610

Int. Cl. A61k *9/06*

U.S. Cl. 424—59 **1 Claim**

A gel of the acid form of a cross-linked co-polymer of ethylene-maleic anhydride of the character sold commercially as EMA–91, a sunscreen agent and sufficient of an alkaline reactant compatible with the co-polymer and sunscreen agent to produce a pH in the range of about 5 to 8. The gel vehicle can be water or water and water-miscible alcohol.

3,821,364

PROCESS OF PRODUCING COLLAGENASE

Angelo J. Chiulli, Hempstead, and Edwin H. Wegman, Freeport, both of N.Y., assignors to Advance Biofactures Corporation, Lynbrook, N.Y.

Division of Ser. No. 563,702, July 8, 1966, Pat. No. 3,705,083. This application Dec. 4, 1972, Ser. No. 312,092

Int. Cl. A61k *19/00*

U.S. Cl. 424—94 **3 Claims**

A non-flagellated, non-motile strain of *Clostridium histolyticum* (ATCC No. 21000), when fermented under conventional conditions for the growth of *Cl. histolyticum*, yields an elaboration product characterized by collagenase and proteolytic enzyme activity and inhibits the growth of microbes such as *Staphylococcus aureus* and organisms of the genus *Clostridium*. This collagenase may be employed in the form of a topical ointment for debridement of necrotic tissue or as an injectable solution to facilitate internal sloughing and readsorption of physiologically antagonistic tissue.

3,821,365

ACCELERATING THE LYSIS OF BLOOD CLOTS

Robert Phillip Johnson, Alma, Mich., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 234,373, March 13, 1972, abandoned. This application Feb. 26, 1973, Ser. No. 336,096

Int. Cl. A61k *19/00, 27/00*

U.S. Cl. 424—94 **11 Claims**

1-Aminoethyl-2-sulfate ester and the corresponding C-alkyl and/or N-alkyl substituted analogs have been found to potentiate blood clot lysis induced by urokinase when a combination of urokinase and one of these sulfate esters is brought in contact with clots of blood from vertebrate animals.

3,821,366

ANTIBIOTIC 19,402 R.P.

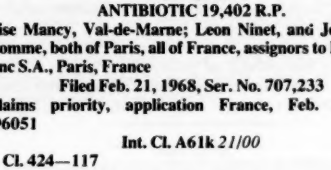
Denise Mancy, Val-de-Marne; Leon Ninet, and Jean Preud'-Homme, both of Paris, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Feb. 21, 1968, Ser. No. 707,233

Claims priority, application France, Feb. 22, 1967, 67.96051

Int. Cl. A61k *21/00*

U.S. Cl. 424—117 **2 Claims**



The new antibiotic designated 19,402 R.P. — an acid — is obtained by the cultivation of the microorganism "Streptomyces 6227" or "Streptomyces peruviensis" NRRL 2757, the characteristics of which are described in British Pat. No. 846,801. The antibiotic and its alkali metal salts are particularly active against gram-positive microorganisms.

3,821,367

ANTIBIOTICS EM-2, EM-3 AND EM-4 AND PROCESS FOR PRODUCING SAME

Alexander D. Argoudelis, Portage, and LeRoy E. Johnson, Kalamazoo Twp., Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 24, 1972, Ser. No. 300,433

Int. Cl. A61k *21/00*

U.S. Cl. 424—119 **9 Claims**

New antibiotics, EM-2 (U-40588), EM-3 (U-40589), and EM-4 (U-40590), produced by the controlled fermentation of a strain of the known microorganism Emericellopsis microspora in an aqueous nutrient medium to which propylproline is added. These antibiotics are primarily active against Gram-positive bacteria and can be used in various environments to eradicate or control such bacteria.

3,821,368

THERAPEUTIC COMPOSITION

Beverly L. Reynolds, Dallas, Tex., assignor to Cybersal, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 149,081, June 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 885,295, Dec. 15, 1969, Pat. No. 3,676,553. This application July 21, 1972, Ser. No. 273,701The portion of the term of this patent subsequent to July 11, 1989, has been disclaimed.

Int. Cl. A61h *27/00*

U.S. Cl. 424—128 **7 Claims**

A therapeutic composition comprised of an aqueous medium containing about 75–150 millimoles of Na^+, about 5–50 millimoles of K^+, about 5–50 millimoles of HCO_3^-, about 75–150 millimoles of Cl^- and preferably containing about 1–30 millimoles of $Mg^{++}$and about 1–30 millimoles of $HPO_4^{=}$ and/or $SO_4^{=}$; the solution having a pH of about 5.95–8.4 and an osmolality of about 170–460 and preferably about 260–340 and more preferably 290–310. The solution can be administered orally but preferably parenterally. Also, the anhydrous form of the composition in a tablet form as well as an oral composition containing flavoring agents is taught.

3,821,369

BIOCIDAL COMPOSITIONS CONTAINING COPPER COMPOUNDS

Robert H. Brink, Jr., Doylestown; Bernard F. Shema, Glenside, and Paul Swered, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Jan. 24, 1972, Ser. No. 220,361

Int. Cl. A01n *13/00*

U.S. Cl. 424—141 **10 Claims**

The present invention relates to certain processes and compositions useful for inhibiting and/or controlling the growth of slime in water and, in particular, water employed for industrial purposes. Water employed in the manufacture of pulp paper and water employed in cooling water systems, as well as other industrial waters, provide environments which are conducive to slime formations. The novel compositions of the present invention are mixtures which show unexpected synergistic activity against microorganisms, including bacteria, fungi and algae, which produce slime in aqueous systems. The slime, of course, is objectionable from an operational and/or an aesthetic point of view. Specifically, the invention is directed to and the use of a composition comprising a combination of 5-chloro-4-phenyl-1,2-dithiole-3-one or derivatives thereof and copper sulfate ($CuSO_4$). The inventive compositions inhibit the growth of slime in water, or more specifically, possess

biocidal activity against bacteria, fungi and/or algae. The derivatives contemplated for use in accordance with the present invention are those which possess the capacity to kill or inhibit the growth of slime-forming microorganisms such as bacteria, fungi and algae.

3,821,370

TOPICAL COMPOSITION FOR TREATING SEBORRHEIC KERATOSIS

Louis T. Tenta, 6007 N. Sheridan Rd., Apt. 24a, Chicago, Ill. 60626

Filed Mar. 11, 1971, Ser. No. 123,380
Int. Cl. A61k *27/00*
U.S. Cl. 424—145 **5 Claims**

A topical composition adapted upon application to the skin to minimize the objectional appearance of surface irregularities, blemishes and discolorations by causing a superficial slough of the damaged portions of the epidermis and a beneficial stimulation of the connective tissue cells of the dermis. The active ingredients of my composition are those furnished by source materials capable of providing active forms of salicylate, resorcinol, phenol and zinc compounds, or are the compounds per se. Additional my composition may contain relatively non-essential ingredients such as substantially anhydrous, non-reactive emollients, demulcents, anesthetics and antiseptics, as for instance glycerin, camphor and lanolin. Instead of using phenol, itself, in my composition it is preferable to use an inactive or inhibited form of phenol, such as an ammonium or alkali metal phenate, or phenolate, capable of being rendered active by exposure to the moisture and carbon dioxide of the atmosphere, which together form carbonic acid (H_2CO_3).

3,821,371

PHARMACEUTICAL COMPOSITIONS CONTAINING MICROCRYSTALLINE COLLAGEN, A WATER-INSOLUBLE, IONIZABLE, PARTIAL SALT OF COLLAGEN

Orlando A. Battista, Ft. Worth, Tex., assignor to Avicon, Inc., Ft. Worth, Tex.

Division of Ser. No. 12,504, Feb. 2, 1970, Pat. No. 3,691,281, which is a division of Ser. No. 586,969, Oct. 17, 1966, abandoned, said Ser. No. 586,969, is a continuation-in-part of Ser. No. 436,371, March 1, 1965, abandoned. This application July 24, 1972, Ser. No. 274,520
Int. Cl. A61k *27/00;* **A611** *15/03;* **A61k** *9/06*
U.S. Cl. 424—145 **8 Claims**

Pharmaceutical compositions which include in addition to the pharmaceutical ingredient or ingredients a water-insoluble, ionizable, partial salt of collagen or microcrystalline collagen. The conposition may be in the form of a pourable liquid, a gel or ointment or a solid compressed tablet. The microcrystalline collagen colloidally dispersed in the liquid improves the stability of suspended ingredients in liquids and gels.

3,821,372

EMULSION CONTAINING OIL, WATER AND AS EMULSIFIER THE POLYCONDENSATION PRODUCT OF GLYCIDOL ON ALPHA DIOLS WITH FATTY CHAIN

Guy Vanlerberghe, Montjay-la-Tour, and Henri Sebag, Paris, both of France, assignors to Societe anonyme dite:L'Oreal, Paris, France

Filed May 11, 1971, Ser. No. 142,409
Claims priority, application Luxembourg, May 12, 1970, 60900; Australia, May 25, 1970, 1312/70; July 31, 1970, 2040/70
U.S. Cl. 424—170 **1 Claim**

A composition comprising in combination (a) as an emulsifier one or more compounds of the formula $R-CHOH-CH_2O+CH_2-CHOH-CH_2-O\frac{1}{n}H$ wherein R is selected from the group consisting of aliphatic, cycloaliphatic and arylaliphatic radicals and mixtures thereof, having 7–21 carbon atoms, wherein the aliphatic moiety of said radicals is saturated or unsaturated, linear or branched, and optionally containing 1–6 ether, thioether and hydroxymethylene groups, and n is greater than 1 and equal to or less than 10, present in amounts of 5–20 percent by weight of said composition, (b) a member selected from the group consisting of peanut oil, castor oil, paraffin oil, purcellin oil, triglycerides of a fatty acid selected from octanoic and decanoic acids, 2-octyl-1-dodecanol and alkyl ester of a fatty acid selected from adipic, myristic and palmitic acid, present in amounts of 10–60 percent by weight of said composition, and (c) water, present in amounts of 30–80 percent by weight of said composition.

3,821,373

ORGANOSILICON COMPOSITIONS IN METHODS OF TREATMENT INVOLVING INCREASING THE DOPAMINE CONTENT OF THE BRAIN

Donald R. Bennett, and Robert R. Levier, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 14, 1973, Ser. No. 359,929
Int. Cl. A61k *27/00*
U.S. Cl. 424—184 **10 Claims**

The dopamine content of the brain tissue of an animal is increased by administering an effective amount of an organosilicon compound selected from the group consisting of 2,6-cis-diphenylhexamethylcyclotetrasiloxane, 2,6-trans-diphenylhexamethylcyclotetrasiloxane and mixtures thereof. Use of such compounds compensates for deficiency of dopamine in the brain tissue which is known to alleviate some of the symptoms caused by Parkinsonism, manganese poisoning and similar diseases.

3,821,374

CHEMICAL COMPOSITIONS

Geln E. Arth, Cranford; Lewis H. Sarett, Princeton, and Arthur A. Patchett, Cranford, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 68,028, Aug. 28, 1970. This application July 18, 1972, Ser. No. 272,837
Int. Cl. C07c
U.S. Cl. 424—238 **7 Claims**

The invention disclosed herein relates to novel steroid compositions and, more particularly, to compositions effective as androgen biosynthesis inhibitors and containing 3-oxygenated-17-acylamido-steroids of the androstane series. The new compositions, comprising 3-oxygenated-17-acylamidoandrostanes and unsaturated derivatives, are extremely active in lowering the biosynthesis of testicular androgens which can stimulate over development of sebaceous glands with resultant acne and which are often productive of prostatic enlargement.

3,821,375

TREATMENT OF OTITIS OF DOGS AND CATS WITH CHLORAMPHENICOL-SQUALANE COMPOSITION

Conrad H. Alper, 26 Dell Dr., E. Rockaway, N.Y. 11518

Continuation of Ser. No. 87,286, Nov. 5, 1970, abandoned, and a continuation-in-part of Ser. No. 843,188, June 18, 1969, abandoned. This application June 2, 1972, Ser. No. 259,346
Int. Cl. A61k *17/00, 27/00*
U.S. Cl. 424—240 **14 Claims**

Treatment of otitis in dogs and cats with a suspension, in a hydrocarbon base, of dispersed chloramphenicol and prednisolone together with dissolved tetracaine and squalane.

3,821,376
FUNGICIDAL USE OF A 1,2,4-TRIAZOLE NICKEL SALT COMPLEX

Horst O. Bayer, Levittown; Richard S. Cook, Doylestown, and William C. Von Meyer, Willow Grove, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 847,482, July 3, 1969, Pat. No. 3,647,810. This application Oct. 28, 1971, Ser. No. 193,558
Int. Cl. A01n 9/22
U.S. Cl. 424—245 **2 Claims**

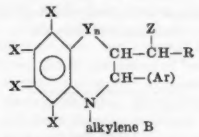
Fungicidal compositions and their use in the control of phytopathogenic fungi which contain as the active ingredient compounds belonging to the class of metal salt complexes of 4-substituted-1,2,4-triazoles.

3,821,377
ANTI-INFLAMMATORY AGENTS

John Krapcho, Somerset, and Chester Frank Turk, Elizabeth, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 228,360, Feb. 22, 1972, Pat. No. 3,763,153. This application Apr. 4, 1973, Ser. No. 347,937
Int. Cl. A61k 27/00
U.S. Cl. 424—246 **4 Claims**

Anti-inflammatory agents of the formula



I

wherein X is hydrogen, halogen, alkyl, haloalkyl, alkoxy, hydroxy, alkylthio, nitro, alkylsulfonyl, amino, alkanoylamino, or mono-or dialkylamino wherein any of the foregoing alkyl or substituted alkyl radicals contain up to 8 carbon atoms; Y is —O—, —S—, $-CH_2-$, $-CH_2CH_2-$, —SO—, $-SO_2-$, or Y may be absent entirely; R is alkyl of up to 8 carbon atoms, cycloalkyl of from 3 to 8 carbon atoms, aryl of up to 10 carbon atoms or aralkyl of up to 10 carbon atoms; Z is Cl, Br, F or I; Ar is a mono- or bicyclic aryl radical selected from the group consisting of phenyl, X-substituted phenyl wherein X is as defined above, alkylenedioxyphenyl, pyridyl, furyl, naphthyl or thienyl; alkylene is a straight or branched carbon chain of up to 6 carbon atoms, B is a basic nitrogen containing radical; N-oxides and pharmaceutically acceptable acid-addition or quaternary ammonium salts thereof. The compounds wherein Z is Cl or Br are obtained by treating a precursor wherein Z is OH with $POCl_3$ or $POBr_3$. Compounds wherein Z is I are obtained by heating compounds wherein Z is Cl with NaI. The fluoro compounds are obtained from either the chloro, bromo, or iodo analogs by heating with excess KF in solvents such as acetamide, nitrobenzene, DMSO, ethylene glycol or diethylene glycol. Heating in the latter solvent at 125°C with 100 percent excess KF is preferred.

3,821,378
2-AMINO-4,6-DIPHENETHYLAMINO-S-TRIAZINE AS ACTIVE SERUM CHOLESTEROL LOWERING AGENT

Tsutomu Irikura, No. 388, Ohizumigakuen-cho; Kyoichi Higo, No. 5-6, 3-chome, Higashi; Akitoshi Maeda, 3-chome, Hirai, Edogawa-ku; Fumihiko Morinaga, 32-14, 3-chome, Ukina, Kita-ku, and Takeshi Naruke, No. 21-9, 3-chome, Boton, all of Tokyo, Japan

Continuation-in-part of Ser. No. 134,394, April 15, 1971, abandoned. This application Sept. 1, 1972, Ser. No. 285,680
Int. Cl. A61k 27/00
U.S. Cl. 424—249 **1 Claim**

The present invention relates to a valuable medicament for oral administration containing 2-amino-4,6-diphenethylamino-s-triazine as an effective ingredient. The drug of this invention is useful for reducing serum cholesterol level and for preventing arteriosclerosis.

3,821,379
1-(P-METHOXYCINNAMOYL)-4-(5-PHENYL-4-OXO-2-OXAZOLIN-2-YL)-PIPERAZINE AS AN ANTI-MALARIAL AGENT

Adolph Oscar Geiszler, Mundelein, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 263,734, June 8, 1972, abandoned. This application July 26, 1973, Ser. No. 382,988
Int. Cl. H61k 27/00
U.S. Cl. 424—250 **1 Claim**

A method of suppressing malarial infections using 1-(p-methoxycinnamoyl)-4-(5-phenyl-4-oxo-2-oxazolin-2-yl)-piperazine as the anti-malarial agent.

3,821,380
2-ALKYLTHIO-4,6-DIAMINO-5-PYRIMIDINESULFONAMIDES AS ANTI-HYPERTENSIVES

Paul L. Anderson, Dover, and Robert E. Manning, Mountain Lakes, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 62,660, Aug. 10, 1970, abandoned. This application Aug. 21, 1972, Ser. No. 282,317
Int. Cl. A61k 27/00
U.S. Cl. 424—251 **6 Claims**

2-Alkylthio substituted 4,6-diamino-5-pyrimidinesulfonamides, e.g., 4,6-diamino-2-methylthio-N-methyl-5-pyrimidinesulfonamide, are prepared by treating 4,6-diamino-2-methylthio-5-pyrimidinesulfonyl halide with primary or secondary amines and are useful as anti-hypertensives.

3,821,381
METHOD OF TREATMENT

Lewis R. Mandel, Edison, N.J., assignor to Merck & Co. Inc., Rahway, N.J.

Division of Ser. No. 223,721, Feb. 4, 1972, Pat. No. 3,749,781, which is a continuation-in-part of Ser. No. 80,176, Oct. 12, 1970, abandoned. This application Apr. 20, 1973, Ser. No. 353,038
Int. Cl. A61k 27/00
U.S. Cl. 424—251 **1 Claim**

A composition for and a method of inhibiting indoleamine-N-methyl transferase comprising the administration to a host of a therapautically effective amount of a compound selected from the group consisting of 2,3-dimercaptoquinoxaline, 2,3,4,6,7,8-hexahydropyrrolo[1,2-a]pyrimidine, Mono-lower alkyl derivatives of 2,3,4,6,7,8-hexahydropyrrolo-[1,2-a]pyrimidine, quinoclidine, 1-pyrrolidinecarboxamidine, 3,4,6,7,8,9-hexahydro-2H-pyrido[1,2-a]pyrimidine, 2,3,4,6,7,8,9,10-octahydropyrimido[1,2-a]azepine, 1-methyl-2-trans-styryl-1,4,5,6-tetrahydropyrimidino, (2,4-dihydroxy-5-pyrimidyl)-disulfide, 2,3-dimethoxy-5-methyl-6-bromobenzoquinone and the pharmaceutically acceptable salts thereof.

3,821,382

5-NITROFURYL DERIVATIVES AS ANTIBACTERIAL AGENTS

William Hoyle, and Graham Arton Howarth, both of Cheshire, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 84,531, Oct. 27, 1970. This application Aug. 23, 1972, Ser. No. 283,134

Claims priority, application Great Britain, Oct. 28, 1969, 52663/69

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 2 Claims

Compounds of the class of 3-(5-nitro-2-furyl)-1H-pyrazolo[3,4-d]pyrimidin-4(5H)-one have antibacterial properties and are active ingredients in pharmaceutical compositions and animal feedstuff compositions, an illustrative example is 1,6-dimethyl-3-(5-nitro-2-furyl)-1H-pyrazolo[3,4-d]pyrimidin-4(5H)-one.

3,821,383

COMPOSITIONS FOR AND A METHOD OF TREATING DIABETIC COMPLICATIONS

Kazimir Sestanj, Laval; Nicole Simard-Duquesne, and Dusan M. Dvornik, both of Montreal, all of Canada, assignors to Ayerst McKenna and Harrison Limited, Laurent, Quebec, Canada

Filed July 10, 1972, Ser. No. 270,357

Int. Cl. A61k *27/00*

U.S. Cl. 424—258 5 Claims

New pharmaceutical compositions, including methods for their preparation and for their use in preventing or relieving diabetic complications are disclosed. More specifically, the pharmaceutical compositions of this invention comprises 1,3-dioxo-1H-benz[de]isoquinoline-2(3H)-acetic acid, and optionally substituted derivatives thereof together with their pharamaceutically acceptable salts.

3,821,384

PHARMACEUTICAL COMPOSITIONS CONTAINING A 4-ARYL-2-(3-PYRIDYL) THIAZOLE AND METHODS OF USING SAME

Zaven S. Ariyan, Woodbury, Conn., and William A. Harrison, Guelph, Ontario, Canada, assignors to Uniroyal Inc.,, New York, N.Y. and Uniroyal Ltd., Montreal, Quebec, Canada

Filed Oct. 6, 1972, Ser. No. 295,501

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 28 Claims

Certain 4-aryl-2-(3-pyridyl)thiazoles are useful as active agents for the central nervous system, e.g., possess anti-anxiety properties.

3,821,385

THIOCARBAMIC ACID DERIVATIVES FOR TREATING MYCOTIC INFECTIONS

Horst Boshagen, Haan/Rhineland, and Manfred Plempel, Wuppertal-Elberfeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

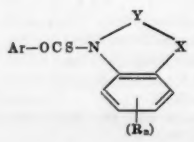
Division of Ser. No. 25,557, April 3, 1970, Pat. No. 3,729,473. This application Aug. 9, 1972, Ser. No. 279,000

Claims priority, application Germany, Apr. 5, 1969, 1917739

Int. Cl. A61k *27/00*

U.S. Cl. 424—258 71 Claims

Compounds of the formula:



wherein

X is sulphur, oxygen, NR^1, CO, CHR^1 or CR^1 wherein R^1 is hydrogen or straight or branched chain lower alkyl,

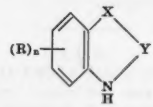
Y is a straight or branched chain aliphatic moiety of 1 to 3 carbon atoms, or said aliphatic moiety linked to X by a double bond,

R is hydrogen, halogen, lower alkyl, lower alkoxy, lower alkylmercapto or trifluoromethyl,

n is 1, 2 or 3, and

Ar is an unsubstituted or substitued aromatic moiety,

are produced by reacting a compound of the formula:



wherein X, Y, R and n are as above defined with a thiocarbonic acid ester halide of the formula:

Hal - CS - O - Ar wherein Hal is halogen and Ar is as above defined. These compounds are useful as antimycotics for the treatment of fungal infections which are pathogenic to humans and animals.

3,821,386

PHARMACEUTICAL COMPOSITIONS AND METHODS OF INHIBITING GASTRIC ACID SECRETION

Bernard Loev, Broomall, Pa., assignor to Smithkline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 226,531, Feb. 15, 1972, Pat. No. 3,749,728. This application Apr. 19, 1973, Ser. No. 352,779

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 10 Claims

Pharmaceutical compositions and methods of inhibiting gastric acid secretion by administering N-cycloalkyl and N-cycloalkanealkylthioamides.

3,821,387

THE TREATMENT OF PARKINSONISM WITH 3-(OMEGA-SUBSTITUTED ALKYL)-INDOLES

William J. Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Filed Oct. 23, 1965, Ser. No. 504,087

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 7 Claims

3-(Omega-substituted alkyl) indoles and their use in the treatment of Parkinsonism.

3,821,388

ANIMAL FEED AND PROCESS

Robert J. Collins, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

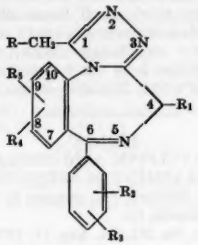
Filed Aug. 9, 1971, Ser. No. 170,323

Int. Cl. A61k *27/00*

U.S. Cl. 424—269 6 Claims

An animal feed for increasing meat, milk, or egg production comprising a compound of the group consisting of a 1-sub-

stituted 6-phenyl-4H-s-triazolo[4,3-a]-[1,4]benzodiazepine of the formula:



Formula 1

wherein R is selected from the group consisting of cyano, nitro, dialkylamino in which alkyl is of 1 to 3 carbon atoms, inclusive, alkoxy in which the alkyl moiety is defined as above, -COOR'' in which R'' is alkyl defined as above; wherein R_1 is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, inclusive; and wherein R_2, R_3, R_4, and R_5 are selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, inclusive, halogen, nitro, cyano, trifluoromethyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl, alkanoyl-amino and dialkylamino in which the carbon chain moieties are of 1 to 3 carbon atoms, inclusive, a pharmacologically acceptable acid addition salt thereof and the N-5 oxide thereof in combination with the nutrient feed.

3,821,389
MICROBIOCIDAL USE OF 1,2-BENZISOTHIAZOLIN-3-ONES

John C. Grivas, Holland, Ill., assignor to The Sherwin Williams Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 873,071, Oct. 31, 1969, abandoned. This application Nov. 15, 1971, Ser. No. 199,007
Int. Cl. A01n *9/12, 9/20*
U.S. Cl. 424—270 **21 Claims**

Certain 2-(ω-substituted alkyl)-1,2-benzisothiazolin-3-ones, are useful as fungicides and may be used to protect exterior paint surfaces from mildew attack by incorporation in the paint composition.

3,821,390
TREATMENT OF SWINE DYSENTERY

Francisco Carrasco Castro, and Carlos Badiola Navarro, both of Madrid, Spain, assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 16, 1973, Ser. No. 341,827
Int. Cl. A61k *27/00*
U.S. Cl. 424—270 **2 Claims**

This disclosure describes compositions of matter useful for the treatment and prophlaxis of hemorrhagic colitis in swine and the methods of controlling and preventing hemorrhagic colitis in swine therewith, the active ingredient of said compositions of matter being 2-acetylamino-5-nitrothia-zole.

3,821,391
1,3-DIMETHYL-4,5-DI(P-SUBSTITUTED PHENYL)6H-PYRROLO(2,3-C) PYRAZOLES IN TREATING INFLAMMATION

Gerard Yvon Paris, Duvernay, Quebec, Canada, and Leo Ralph Swett, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 257,732, May 30, 1972, abandoned, which is a division of Ser. No. 112,767, Feb. 4, 1971, Pat. No. 3,701,785. This application Mar. 15, 1973, Ser. No. 341,443
Int. Cl. A61k *27/00*
U.S. Cl. 424—272 **13 Claims**

Novel 1,3-dimethyl-4,5-di(p-substituted phenyl)-6H-pyrrolo[2,3-c]pyrazoles and novel intermediates useful in their synthesis. The compounds are useful as anti inflammatory and anti-pyretic agents.

3,821,392
METHOD OF ADMINISTERING CYCLOSERINE

Roger L. Harned, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Mar. 19, 1973, Ser. No. 342,664
Int. Cl. A61k *27/00*
U.S. Cl. 424—272 **3 Claims**

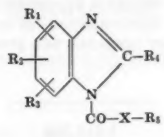
A method of administering cycloserine to an animal for prophylactic or therapeutic purposes by metering a concentrated alkaline solution of cycloserine into the drinking water provided for the animal in an amount sufficient to provide an effective dosage.

3,821,393
FUNGICIDAL PREPARATIONS CONTAINING BENZIMIDAZOLE COMPOUNDS

Stefan Janiak, Basel, and Otto Rohr, Therwil, both of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

Division of Ser. No. 769,699, Oct. 22, 1968, Pat. No. 3,652,580. This application Jan. 10, 1972, Ser. No. 216,783
Claims priority, application Switzerland, Oct. 26, 1967, 15005/67
Int. Cl. A01n *9/22*
U.S. Cl. 424—273 **6 Claims**

The invention relates to fungicidal benzimidazolyle derivatives of the general formula



wherein R_1, R_2 and R_3 may be identical or different and each represents hydrogen, halogen, alkyl, alkoxy, alkylthio, alkyl-SO-, alkylSO_2-, -NO_2, -CN, CF_3, CHO, COOR',

or

wherein R' and R'' each represents hydrogen or lower alkyl and R_4 represents hydrogen or an aliphatic or cycloaliphatic

residue, X = O, S, -NH- or N-alkyl and R_3 represents an aliphatic, araliphatic or aromatic residue.

These new compounds are very effective as ingredients in biocidal preparations for plant-protection and combating insects, acarides, nematodes.

3,821,394

ANTIMYCOTIC COMPOSITION AND METHOD EMPLOYING A SUBSTITUTED BENZYL-AZOLES

Helmut Timmler; Wilfried Draber; Karl Heinz Buchel, and Manfred Plempel, all of Wuppertal-Elberfeld, Germany

Division of Ser. No. 165,321, July 22, 1971. This application Dec. 22, 1972, Ser. No. 317,835

Claims priority, application Germany, July 29, 1970, 2037610

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 **21 Claims**

1-Benzylimidazoles and 1-benzyl-1,2,4-triazoles bearing both an alkyl, phenyl or cycloalkyl group and a formyl, alkanoyl, aroyl or cycloalkylcarbonyl group on the α-carbon atom of the benzyl group, as well as the ketals, acetals, oximes and semicarbazones thereof, are antimycotic agents. They are prepared by treating the corresponding α-halobenzyl compounds with imidazole or 1,2,4-triazole or the corresponding α-hydroxybenzyl compounds with the appropriate thionyl bisazole. A typical embodiment is the preparation of diphenylacetyl-imidazol-1-yl-methane from 1-bromo-1,1-diphenyl-2-propanone and imidazole.

3,821,395

N-(4-FLUOROPHENYL)-2,3-DICHLOROMALEIMIDE USED AS A FUNGICIDE

Seigo Kawada, Kikukawa; Hideo Ito, Shimizu; Kazuo Matsui, and Hiroshi Kasugai, both of Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Division of Ser. No. 104,464, Jan. 6, 1971, Pat. No. 3,734,937. This application Sept. 14, 1972, Ser. No. 288,936

Claims priority, application Japan, Jan. 10, 1970, 45-3143

Int. Cl. A01n *9/22*

U.S. Cl. 424—274 **5 Claims**

The compound, N-4(-fluorophenyl)-2,3-dichloromaleimide, has been found to possess good fungicidal properties, particularly for such plant diseases as tomato diseases, rice blight, anthracnose disease in cucumbers and black spot disease in citrus fruit. This compound can be effectively used in lower concentrations compared with previously known fungicidal maleimides.

3,821,396

COMPOSITION AND METHOD FOR CONTROLLING AEROBACTER AEROGENES

Bernard F. Shema, Glenside; Robert H. Brink, Jr., Doylestown, and Roger L. Justice, Warminster, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 23, 1972, Ser. No. 237,534

Int. Cl. A01n *9/02*

U.S. Cl. 424—275 **24 Claims**

The present invention relates to certain processes and compositions useful for inhibiting and/or controlling the growth of slime in water and, in particular, water employed for industrial purposes. Water employed in the manufacture of pulp paper and water employed in cooling water systems, as well as other industrial waters, provide environments which are conducive to slime formation. The novel compositions of the present invention are mixtures which show unexpected synergistic activity against microorganisms, including bacteria, fungi and algae, which produce slime in aqueous systems. The slime, of course, is objectionable from an operational and/or an aesthetic point of view. Specifically, the invention is directed to and the use of compositions comprising a combination of 3,3,4,4,-tetrachlorotetrahydrothiophene-1,1-dioxide and anionic sulfonate surfactants (or mixtures thereof). The inventive compositions inhibit the growth of slime in water, or more specifically, possess biocidal activity against bacteria, fungi and/or algae. The anionic sulfonate surfactants contemplated for use in accordance with the present invention may be exemplified by: alkali metal linear alkylate sulfonate, wherein the alkylate contains from 10 to 18 carbon atoms; and alkali metal-N-lower alkyl-N-high alkenoyl taurate, wherein the lower alkyl contains from 1 to 4 carbon atoms and the alkenoyl contains from 16 to 20 carbon atoms.

3,821,397

4-CYCLOHEXYLVULPINIC ACID DERIVATIVES IN THE TREATMENT OF ARTHRITIS

Blaine M. Sutton, Hatboro, Pa., assignor to Smithkline Corporation, Philadelphia, Pa.

Division of Ser. No. 282,534, Aug. 21, 1972, which is a continuation-in-part of Ser. No. 188,439, Oct. 13, 1971, abandoned. This application May 7, 1973, Ser. No. 357,762

Int. Cl. A61k *27/00*

U.S. Cl. 424—279 **2 Claims**

4-Cyclohexylvulpinic acid derivatives having anti-arthritic activity prepared by alcoholysis of the corresponding 4-cyclohexylpulvinic acid dilactone.

3,821,398

SUBSTITUTED 2,5-DIPHENYL-3,4,6-TRIHYDROXY-DELTA 2,4-HEXADIENOIC ACID LACTONES (1,4) IN THE TREATMENT OF ARTHRITIS

Blaine M. Sutton, Hatboro, Pa., assignor to Smithkline Corporation, Philadelphia, Pa.

Division of Ser. No. 148,890, June 1, 1970, Pat. No. 3,772,341. This application July 30, 1973, Ser. No. 383,643

Int. Cl. A61k *27/00*

U.S. Cl. 424—279 **6 Claims**

2,5-Diphenyl-3,4,6-trihydroxy-$\Delta^{2,4}$-hexadienoic acid lactones (1,4) in which the phenyl moieties are each optionally substituted by chlorine, bromine, fluorine, methyl, methoxy, dimethoxy, trimethoxy or trifluoromethyl and having anti-arthritic activity are generally prepared by diborane reduction of corresponding pulvinic acid derivatives.

3,821,399

BIOACTIVE SULFONES

Sven U.K.A. Richter, Stocksund, Sweden, assignor to Sanitized, Incorporated, New York, N.Y.

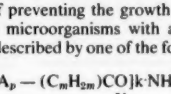
Continuation-in-part of Ser. No. 844,176, July 23, 1969, abandoned, which is a continuation-in-part of Ser. No. 545,835, April 28, 1966, abandoned. This application Feb. 22, 1972, Ser. No. 228,410

Int. Cl. A01n *9/20*

U.S. Cl. 424—304 **14 Claims**

A method of preventing the growth of microorganisms by contacting the microorganisms with a bioactive compound which may be described by one of the following formulas:

$$H[(C_nH_{2n})-A_p-(C_mH_{2m})CO]k\cdot NHC_6H_4SO_2-CH=CH-X;$$



or

$$R_3SO_2CH=CH-CONH_2$$

in which A is benzene or naphthalene, X is —CN, —$CONH_2$, —COOR, —SO_2R, —SO_3R, —NO_2 or —COR, R_1 is an amino, acylamido or nitro group, R_2 is hydrogen or a lower alkyl

group, R_3 is an alkyl, substituted alkyl, aryl, substituted aryl, cycloakyl, or substituted cycloalkyl and where $n = 0$ to 18, $m = 0$ to 18, $m + n = 24$ or less, $p = 0$ or 1 and $k = 0$ or 1.

3,821,400

METHOD OF CONTROLLING GASTROPODS

Dieter Duerr, Bottmingen; Hans Aebi, Reinach/Basel-land, and Ludwig Ebner, Stein/AG, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 424,820, Jan. 11, 1965, abandoned. This application Mar. 20, 1968, Ser. No. 714,406
Claims priority, application Switzerland, Jan. 13, 1964, 306/64; Aug. 12, 1964, 10543/64
Int. Cl. H01n *9/12*
U.S. Cl. 424—304 **2 Claims**

Moluscicidal preparations are provided containing a suitable carrier with, as the active agent, a compound of the formula

wherein R is selected from the group consisting of unsubstituted phenyl, substituted phenyl and naphthyl, R_1 is hydrogen, lower alkyl, alkenyl, aralkyl or an acidifying group; or the salts of these compounds with inorganic or organic bases.

3,821,401

3.5-DIACYLOXYBENZOIC ACIDS USED AS ANTI-INFLAMMATORY AGENTS

William B. Lacefield, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sept. 13, 1971, Ser. No. 180,161
Int. Cl. A61k *27/00*
U.S. Cl. 424—308 **8 Claims**

Methods employing and compositions comprising specified 3,5-diacyloxybenzoic acids or their derivatives as anti-inflammatory agents.

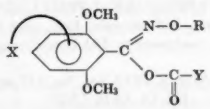
3,821,402

BENZOHYDROXAMATES AND THEIR USE AS ACARICIDES

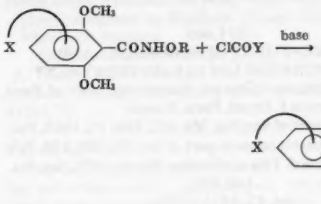
Teruhisa Noguchi, No. 8-11, 2-chome, Kugenumakaigan, Fujisawa-shi, Kanagawa-ken; Mitsuo Asada, No. 9-23, Ianjogaoka, Hiratsuka-shi, Kanagawa-ken; Reiji Sakimoto, No. 7-38, Kyomachi, Takaoka-shi, Toyama-ken, and Koichi Hashimoto, Ri-No. 45, Aza-Kawachi, Tsubatamachi, Kahohu-gun, Ishikawa-ken, all of Japan

Filed May 24, 1972, Ser. No. 256,485
Int. Cl. A01n *9/20*
U.S. Cl. 424—308 **2 Claims**

The compound having formula:



(wherein R represents an alkyl component of 1 through 4 carbon atoms, or alkenyl component of 1 through 4 carbon atoms, X represents hydrogen, methoxy or halogen and Y represents phenyl or phenyl substituted with methyl, chlorine, or nitro) are prepared in accordance with the following equations:



(wherein R, X and Y represent the aforementioned Components) The compounds are acaricides.

3,821,403

METHOD OF COMBATTING BACTERIA OR FUNGI ON PLANTS USING AMINO ACID HIGHER ALKYL ESTERS

Tomomasa Misato, Tokyo; Keng Tang Huang, Wako; Yasuo Homma, Fukuoka-Machi; Ryonosuke Yoshida, Kamakura; Tadaomi Saito, Yokohama, and Akira Shimizu, Kawasaki, all of Japan, assignors to Rikagaku Kenkyusho,, Wako-shi, Saitamia-ken, Japan and Ajinomoto Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1972, Ser. No. 219,550
Int. Cl. A01n *9/20, 9/24*
U.S. Cl. 424—311 **1 Claim**

Amino acid higher alkyl esters, salts thereof and their N-lower alkyl derivatives are useful for controlling numerous plant diseases. They exhibit excellent protective effect rather than curative effect and have no phytotoxicity, extremely low mammalian toxicity and cause no risk of pollution toward soils.

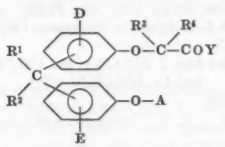
3,821,404

PHENOXY CARBOXYLIC ACID DERIVATIVES AS ANTI-ATHEROSCLEROSIS AGENTS

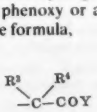
Yasushi Nakamura, Iberagi; Kunio Agatsuma, Takarazuka; Yoshihiro Tanaka, Takarazuka, and Shunji Aono, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Division of Ser. No. 26,412, April 7, 1970, Pat. No. 3,716,583. This application Dec. 10, 1971, Ser. No. 206,966
Int. Cl. A61k *27/00*
U.S. Cl. 424—317 **8 Claims**

Anti-atherosclerosis agents having the formula



wherein typical examples of R^1 and R^2 are hydrogen, C_1–C_8 alkyl, phenyl, benzyl, and phenethyl, or R^1 and R^1 may form cycloalkylidene together with a carbon atom bonded therewith; R^3 and R^4 each is hydrogen or C_1–C_4 alkyl, Y is hydroxyl, C_1–C_4 alkoxy, phenoxy or an amine residue, A is hydrogen or a group of the formula,



wherein R^3, R^4 and Y have the same meanings as defined above; and D and E each is hydrogen or halogen are disclosed.

3,821,405
ORAL TREATMENT OF SEBORRHEA AND COMPOSITIONS FOR USE IN SAID TREATMENT
Gregoire Kalopissis, and Georges Manoussos, both of Paris, France, assignors to L'Oreal, Paris, France
Continuation-in-part of Ser. No. 706,652, Feb. 19, 1968, Pat. No. 3,629,452, Continuation-in-part of Ser. No. 801,154, Feb. 20, 1969, abandoned. This application May 6, 1971, Ser. No. 140,956
Int. Cl. A61k 27/00
U.S. Cl. 424—319 2 Claims

A method for treating a scalp characterized by an excessive secretion of sebum, to improve the condition thereof by reducing said excessive secretion comprising orally administering to a human being having a scalp so characterized a therapeutic composition comprising an ingestible carrier admixed with, as a non-toxic active compound, cysteine or cysteamine derivatives, the active compound is present in amounts of about 0.75–3 weight percent of the composition which is administered at a rate about 1–5 mg/kg/day based on the weight of the human being during a period of about 15 days.

3,821,406
THERAPEUTIC COMPOSITIONS CONTAINING 1-SUBSTITUTED BIGUANIDES AND METHOD OF TREATING GASTROINTESTINAL DISORDERS THEREWITH
Julius Diamond, Lafayette Hill, and William J. Novick, Jr., Gwynedd, Pa., assignors to William H. Rorer Inc., Fort Washington, Pa.
Filed Mar. 2, 1970, Ser. No. 15,967
Int. Cl. A61k 27/00
U.S. Cl. 424—326 4 Claims

1-Aryl and aralkyl biguanides and their acid addition salts in suitable pharmaceutical dosage form are useful in the treatment of gastrointestinal disorders.

3,821,407
AMINO DERIVATIVES OF TETRASUBSTITUTED BENZENE COMPOUNDS
John J. Merianos, Jersey City, and Phillip Adams, Murray Hill, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.
Filed Apr. 2, 1971, Ser. No. 130,783
Int. Cl. A01n 9/24, 9/20
U.S. Cl. 424—330 1 Claim

Antimicrobial 1, 2, 4, 5-tetrasubstituted benzenes having the structure:

wherein R and R′ and may be methyl, or a halogen when R‴ is $-CH_2-$; or R and R′, taken together, may be methylene dioxy; R″ may be methyl or nitro; R‴ may be absent or may be $-CH_2-$ or $-CH=$; and Z is the residue of a substituted amino or a polyamino radical.

3,821,408
COMPOSITIONS OF SULFONIUM YLIDES AND METHOD OF USE
Joseph William Marsico, Jr., Pearl River, N.Y.; Andrew Stephen Tomcufcik, Old Tappan, N.J., and Leon Goldman, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
Filed Dec. 26, 1972, Ser. No. 317,996
Int. Cl. A61k 27/00
U.S. Cl. 424—331 8 Claims

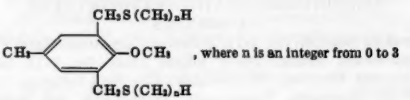
Compositions containing 3-dialkylsulfonium ylides of 2-hydroxy-1,4-napthoquinone and method of use is described. The compositions are useful as anti-inflammatory agents.

3,821,409
METHOD OF TREATMENT
Lewis R. Mandel, Edison, N.J., assignor to Merck & Co., Inc., Rahway, N.J.
Division of Ser. No. 223,721, Feb. 4, 1972, Pat. No. 3,749,781, Continuation-in-part of Ser. No. 80,176, Oct. 12, 1970 abandoned. This application Apr. 20, 1973, Ser. No. 353,039
Int. Cl. A61k 27/00
U.S. Cl. 424—332 1 Claim

A composition for and a method of inhibiting indoleamine-N-methyl transferase comprising the administration to a host of a therapeutically effective amount of a compound selected from the group consisting of 2,3-dimercapto-quinoxaline, 2,3,4,6,7,8-hexahydropyrrolo[1,2-a]pyrimidine, Mono-lower alkyl derivatives of 2,3,4,6,7,8-hexahydropyrrolo-[1,2-a]pyrimidine, quinuclidine, 1-pyrrolidinecarboxamidine, 3,4,6,7,8,9-hexahydro-2H-pyrido[1,2-a]pyrimidine, 2,3,4,6,7,8,9,10-octahydropyrimido[1,2-a]azepine, 1-methyl-2-trans-styryl-1,4,5,6-tetrahydropyrimidine, (2,4-dihydroxy-5-pyrimidyl)mdisulfide, 2,3-dimethoxy-5-methyl-6-bromobenzoquinone and the pharmaceutically acceptable salts thereof.

3,821,410
FUNGICIDAL USE OF CERTAIN THIOBENZENOID COMPOUNDS
Harold Marvin Foster, Park Forest, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio
Division of Ser. No. 865,981, Oct. 13, 1969, Pat. No. 3,621,065. This application Mar. 22, 1971, Ser. No. 126,980
Int. Cl. A01n 9/12
U.S. Cl. 424—337 4 Claims

A class of compounds having the structure:



, where n is an integer from 0 to 3

are useful as microbiocides.

3,821,411
REDUCTION OF SERUM CHOLESTEROL LEVELS WITH THE DIMETHYL ACETAL OF 1-(2,4-DI-SEC-BUTYLPHENOXY)-2-PROPANONE
James W. Barnhart, Indianapolis, Ind., and Philip J. Shea, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Mar. 5, 1973, Ser. No. 337,863
Int. Cl. A61k 27/00
U.S. Cl. 424—341 4 Claims

Pharmaceutical compositions containing the dimethyl acetal of 1-(2,4-di-sec-butylphenoxy)-2--propanone and methods of producing a hypocholesteremic effect in mammals are provided.

3,821,412
PREVENTION OF FOOT ROT

Lloyd Woodbury Trevoy, Edmonton, Alberta; Jeremy Greenfield, Saskatoon, Saskatchewan; Christopher Hedley Bigland, Saskatoon, Saskatchewan; James Douglas Milligan, Saskatoon, Saskatchewan, and John Roman Moisey, Edmonton, Alberta, all of Canada

Filed June 12, 1972, Ser. No. 261,865
Int. Cl. A61k *27/00*
U.S. Cl. 424—342 3 Claims

A method which involves the treatment with paraformaldehyde of area, where the sheep or cattle spend time, for controlling the major problem of foot-rot of cattle and sheep. Preferably the treatment is made by even spreading of about 8 – 20 lbs. of paraformaldehyde per 1,000 square feet. The method may also be applied to limited area such as watering trough, water hole, feed-bunk and salt lick. At present the effectiveness of the methods known for controlling foot-rot are highly questionable.

3,821,413
ATMOSPHERIC GLYCAL GERMICIDES

Henry L. Hellyer, Jr., 99 Haques Mill Rd., Ambler, Pa. 19002

Filed Apr. 12, 1972, Ser. No. 243,244
Int. Cl. A01n *9/24*
U.S. Cl. 424—343 4 Claims

An aerial disinfectant composition comprising a homogeneous, single phase liquid mixture of (a) from about 5 percent to about 85 percent by weight of a glycol germicide; (b) from about 2 percent to about 40 percent by weight of an organic polar coupling compound for maintaining the homgeneity of said mixture to prevent the glycol from separating from the mixture during evaporation of the mixture into the atmosphere; and (c) from about 5 percent to about 80 percent by weight of an organic, relatively non-polar compound for forming hydrophobic micelles surrounding the glycol molecules in said mixture for reducing the affinity of said glycol to atmospheric moisture and thereby increasing the rate of evaporation of said glycol. The composition is especially adapted for volatilization at a substantially uniform rate from an air circulator device into the surrounding atmosphere continuously to reduce the air-borne bacteria in such atmosphere. According to a preferred embodiment, the glycol component (a) is propylene glycol or a mixture of propylene glycol and triethylene glycol; component (b) comprises from 2 percent to 40 percent of a mixture of beta-phenylethyl alcohol and alpha-terpineol; and component (c) comprises from 5 percent to 80 percent of a mixture of linalyl acetate, isoamyl salicylate and benzyl acetate.

3,821,414
DIRECT COMPRESSION VEHICLE

Anthony Monti, Irvington, N.Y., assignor to SuCrest Corporation, New York, N.Y.

Continuation of Ser. No. 885,980, Dec. 17, 1969, abandoned. This application Sept. 30, 1971, Ser. No. 185,344
Int. Cl. A61k *9/00*; C08b *25/00, 27/04*
U.S. Cl. 424—361 3 Claims

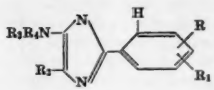
A mixture of a major amount of tricalcium phosphate and a minor amount of locust bean gum is useful for the preparation of tablets by the direct compression technique. The mixture is admixed with an active material, and, if desired, fillers, disintegrating agents and lubricants, and the resulting mixture is compressed without prior granulation or slugging to form a tablet.

3,821,415
HETEROCYCLIC COMPOUNDS IN PHARMACEUTICAL COMPOSITIONS AND METHODS

James Heyes, Peaslake, and Neal Ward, Tadworth, both of England, assignors to Beecham Group Limited,, Brentford, Middlesex, England

Division of Ser. No. 174,253, Aug. 23, 1971, Pat. No. 3,772,319. This application Mar. 31, 1972, Ser. No. 240,250
Claims priority, application Great Britain, Aug. 27, 1970, 41261/70
Int. Cl. A61k *27/00*
U.S. Cl. 424—273 11 Claims

Pharmaceutical compositions which are useful for producing anti-inflammatory and analgesic effects are produced which comprise a compound of the formula:



wherein R and R_1 are each hydrogen, halogen, a carboxylic acid group or an ester or amide thereof, nitro, trifluoromethyl unsubstituted or substituted alkyl of one to four carbon atoms, aryl, hydroxy or an etherified or esterified derivative thereof, a primary or secondary amino or an acyl derivative thereof, or tertiary amino; R_2 is an amide, carboxylic acid group or an unsubstituted or substituted ester or aryl; R_3 and R_4 are each hydrogen or alkyl, or a tautomer thereof, an acid addition salt thereof, a hydrate thereof or a hydrated acid addition salt thereof, in combination with a pharmaceutically acceptable diluent, carrier or excipient.

3,821,416
DRIED BREWERS GRAIN IN HIGH ENERGY ANIMAL FEEDS

Granville B. Thompson, Crestwood, and Robert D. Seeley, Columbia, both of Mo., assignors to The Curators of the University of Missouri, Columbia, Mo., by said Thompson and Anheuser-Busch, Incorporated, St. Louis, Mo., by said Seeley

Filed July 1, 1971, Ser. No. 158,988
Int. Cl. A23k *1/00*
U.S. Cl. 426—2 8 Claims

This disclosure relates to a method of preventing liver abscesses in the feeding of cattle on high concentrate rations, i.e., those rations containing more than 75 percent corn, by incorporating up to about 20 percent by weight dried brewers grains in the ration.

3,821,417
FLAVOR PRESERVATION IN CHEWING GUM COMPOSITIONS AND CANDY PRODUCTS

Edward B. Westall, San Jacinto, Calif.; James J. Scanlan, Hilladale, N.J., and Miroslaw Sahaydak, Great Neck, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.Y., by said Scanlon and Sahaydak

Continuation-in-part of Ser. No. 88,144, Nov. 9, 1970, abandoned. This application Oct. 14, 1971, Ser. No. 189,374
Int. Cl. A23g *3/00, 3/30*
U.S. Cl. 426—3 40 Claims

A dihydrochalcone compound or a mixture of dihydrochalcone compounds and salts thereof, added at concentrations of at least 0.0025 percent by weight, based on the weight of the total formulation, have been found to modify deterioration of essential oil flavors in chewing gum compositions and candy products. in addition, these dihydrochalcone preservatives prolong flavor qualities during the chewing of gum composi-

tions. Neohesperidin and naringin dihydrochalcones and mixtures thereof have been found to be particularly effective in the preservation of oil of peppermint flavor.

3,821,418

PREPARATION OF ALCOHOLIC MALT BEVERAGES

Yoshiyasu Kosano, Tokyo; Shin Nakajima, Neyagawa, and Masaru Yagiu, Tokyo, all of Japan, assignors to Suntory Ltd., Osaka, Japan

Filed July 26, 1972, Ser. No. 275,220
Claims priority, application Japan, Feb. 18, 1972, 47-17372
Int. Cl. C12c *11/04*
U.S. Cl. 426—16 **10 Claims**

A process of producing a malt beverage concentrate which comprises adding yeast to a wort to carry out primary fermentation, removing yeast from an unmatured malt beverage during or after the primary fermentation, concentrating said unmatured malt beverage freed from yeast and carrying out the maturation by adding yeast to the resulting concentrate and a process of producing a reconstituted malt beverage which comprises adding water and/or carbon dioxide to the concentrate after the completion of the maturation.

3,821,419

INTERMEDIATES IN BREWING

James Richard Allan Pollock, Reading, England, assignor to The Dixon Malt Company Limited and The Enzymic Malt Company Limited, both of London, England

Continuation of Ser. No. 71,388, Sept. 11, 1970, abandoned.
This application Dec. 18, 1972, Ser. No. 315,909
Claims priority, application Great Britain, Sept. 17, 1969, 45834/69
Int. Cl. C12c *7/00*
U.S. Cl. 426—29 **6 Claims**

A brewing process uses a special malt in the grist, and this enables a high proportion of adjunct to be used. The total amount of adjunct used, either in the grist or in the wort produced by meshing a grist, or both, is 30 percent or more.

3,821,420

STABILIZED COCOA FLAVORED SYRUPS AND METHODS OF MAKING AND USING THE SAME

Sidney Arden, Forest Hills, N.Y., assignor to Consolidated Food Corporation d/b/a Popsicle Industries, Englewood, N.J.

Filed Apr. 14, 1971, Ser. No. 134,049
Int. Cl. A23g *1/00*
U.S. Cl. 426—45 **10 Claims**

Cocoa flavored syrups having a high cocoa content and excellent stability and flow properties at room temperature may be produced by using an amylolytic enzyme and a sufficient proportion of Dutch process cocoa to provide a syrup pH of 5.5 to 7.5. The syrup is made by alternate addition of cocoa and sweetner to sufficient water to achieve a solids content of about 58 to 65 weight percent, adding an amylolytic enzyme, heating to a temperature of about 175° to 185° F. for at least 10 to 15 minutes, raising the temperature to about 200° F. and cooling. The stabilized cocoa flavored syrups may be added at room temperature to conventional non-acid confection mixes for use in the production of quiescently frozen chocolate flavored confections.

3,821,421

PROCESS FOR THE FLAVOURING OF FOODS

Willem Johan Begemann, Den Haag, and Pieter Daniel Harkes, Vlaardingen, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed July 6, 1971, Ser. No. 160,116
Int. Cl. A23l *1/26*
U.S. Cl. 426—65 **24 Claims**

A process to impart an improved savoury, in particular chicken flavour to foods in which 4cis-decanal is incorporated in foods such as (dry) soups and ready meals, besides aldehydes having 11–17 carbon atoms and 2–4 double bonds, especially besides 2trans,4cis,7cis-tridecatrienal and 2trans,6cis-dodecadienal. Instead of the aldehydes, precursors thereof may be used which yield the said aldehydes in situ, for instance the diethyl acetal and 2-(3cis-nonenyl)-thiazolidine-4-carboxylic acid.

The aldehydes and/or their precursors may be incorporated when coated, e.g. in a maltose-dextrin powder containing for instance 0.1–10 mg 4cis-decenal per gram.

The desired amount of 4cis-decanal is 0.003–0.03 mg/kg food product ready for consumption.

3,821,422

DEVIL'S FOOD CAKE AND OTHER ALKALINE BAKERY GOODS

Lewis D. Morse, Princeton; Paul A. Hammes, Westfield, and William A. Boyd, Plainfield, all of N.J., assignors to Merk & Co., Inc., Rahway, N.J.

Filed Mar. 4, 1971, Ser. No. 121,121
Int. Cl. A23l *1/30*
U.S. Cl. 426—72 **4 Claims**

The deteriorating action on thiamine of neutral or alkaline conditions in dough batter for, e.g. devil's food cake, is overcome by using thiamine which is microencapsulated in a continuous ethylcellulose coating.

3,821,423

HOLLOW ARTICLE MADE OF CHOCOLATE

Everard Joseph Maria Jamin, Rotterdam, Netherlands, assignor to C. Jamin N. V., Rotterdam, Netherlands

Filed Dec. 28, 1971, Ser. No. 213,042
Int. Cl. A23g *3/00*
U.S. Cl. 426—106 **3 Claims**

A hollow article of chocolate with a removable figured body made of a blank, said blank being provided with a strip for varying the inner side of the figurated body.

3,821,424

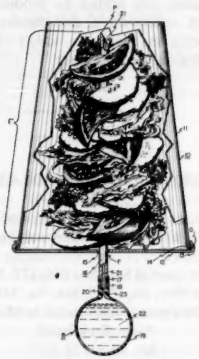
PRESERVATION OF PACKAGED FOODSTUFF

Grahame Warwick Gould, Bedford, England, assignor to Lever Brother Company, New York, N.Y.

Filed June 23, 1972, Ser. No. 265,937
Int. Cl. A23b *1/00;* **A23l** *3/00;* **B65b** *55/00*
U.S. Cl. 426—106 **3 Claims**

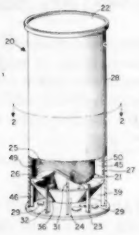
A package contains a moist-foodstuff which would normally be subject to microbial spoilage but which has an alkaline pH to preserve it during storage. Mixed with this foodstuff is an alkali-neutralising substance which is not available to act upon the foodstuff during storage at ambient temperature but which is releasable to neutralise to foodstuff when the content of this package are heated prior to consumption.

3,821,425
SALAD ON A STICK
Rodney E. Russell, 4460 Wallace Ln., Salt Lake City, Utah 84117
Filed Sept. 5, 1972, Ser. No. 286,152
Int. Cl. B65b 29/10
U.S. Cl. 426—110 5 Claims



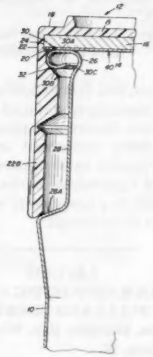
A food storing and serving device comprising an elongate member temporarily principally enclosed within a combination container and lid. The elongated member or "stick" is constructed to pierce a series of meat and/or vegetable items and includes a hollow interior, serving as a conduit for the passage of liquid flavoring medium such as salad oil, dressing, sauce, or the like. A squeeze-type bulb is intimately associated with the stick such that depression of the former will cause the salad oil or dressing, for example, to exude upwardly through the interior of the stick so that the same comes out the end thereof and descends gradually over the food items disposed upon the stick. A frictional engagement is enjoyed as between the stick and lid such that the latter may serve to advance food to the end of the stick and also serve as a base for catching any drippings as the device is held erect.

3,821,426
PACKAGE OF FRANGIBLE CONNECTIBLE PRODUCTS AND MEANS FOR RETAINING CRUMBS THEREOF
Thomas J. Slone, Forest Park, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio
Filed Apr. 27, 1972, Ser. No. 248,135
Int. Cl. B65b 23/16; B65d 85/30
U.S. Cl. 426—115 4 Claims



The packaging of frangible products subject to having crumbs and/or fragments broken therefrom wherein means is provided for retaining such crumbs and/or fragments within the package when the package is positioned to pour products therefrom.

3,821,427
COFFEE PACKAGE
William Howard Enzie, Indianapolis, Ind.; Norman Alfred Vanasse, Mahwah, N.J.; Gerald Thomas Tracy, Stamford, and Harry Thomas Easton, Greenwich, both of Conn., assignors to General Foods Corporation, White Plains, N.Y.
Division of Ser. No. 28,330, April 14, 1970. This application Oct. 4, 1971, Ser. No. 186,464
Int. Cl. B65b 31/02; B65d 43/10
U.S. Cl. 426—131 12 Claims



A food package comprised of a container and closure combination and coffee packaged therein. The container and closure combination of the package comprising metal container having an open top and a sealed bottom panel; the open top of the container is defined by a peripheral flattened bead constructed to receive a closure which is comprised of an inner-seal membrane adhesively affixed to the peripheral bead and detachably bonded to a reinforcing backing to form a liner overlayed by a protective plastic snap-on cap which snugly grips the bead and is capable of acting as a reclosure after the innerseal is ruptured or removed.

3,821,428
METHOD FOR PREPARING LOW-CALORIE AERATED STRUCTURE
Elizabeth Farkas, Yonkers, N.Y., assignor to General Foods Corporation, White Plains, N.Y.
Filed July 21, 1972, Ser. No. 274,032
Int. Cl. A23l 1/18
U.S. Cl. 426—141 4 Claims

A puffed foam-like structured food product is made by baking a dough piece from a mixture of xanthan gum and dextrin.

3,821,429
PROCESS FOR MANUFACTURING INSTANT COFFEE AND THE PRODUCT OF SAID PROCESS
Michael P. Jolly, Highland Mills; Norman P. Quellette, Tarrytown, both of N.Y.; Rudolf A. Vitti, Dumont, N.J., and Salvatore M. Pinzone, Bronxville, N.Y., assignors to General Foods Corporation, White Plains, N.Y.
Filed June 7, 1972, Ser. No. 260,679
Int. Cl. A23f 1/08
U.S. Cl. 426—147 13 Claims

Ground, spray dried coffee spheres are agglommerated in a hot, humid atmosphere to effect fusion thereof at points of contact under conditions which produce a coarse moist agglommerat-containing major fraction which is blended with a freeze dried drier minor fraction obtained from dilute, rapidly

frozen quality extract ground to a particle size distribution approximating the major fraction, the frozen dilute extract being granulated, freeze dried, blended and hermetically packaged with the major fraction to provide a distinctive speckled blend suggestive of roasted and ground coffee appearance.

3,821,430

COFFEE PRODUCT AND PROCESS

Robert C. Reeves, Wyckoff; Michael Mansky, Upper Montclair; Napoleon Stavropoulos, Fort Lee; William W. Kaleda, Washington Twp., all of N.J., and Willie J. Richards, Garnerville, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 14, 1972, Ser. No. 280,619

Int. Cl. A23f *1/08*

U.S. Cl. 426—147 **30 Claims**

This invention concerns production of instant coffee blends composed of two dissimilarly surfaced dried coarse granular extracts having diverse flavors and appearances, the first being a quality freeze dried component and the second being preferably a lower quality lightly roasted Robusta containing irregularly surfaced agglomerate derived by spray drying and fusion agglomeration to a low density which is approximated by that of the freeze dried extract.

3,821,431

CHERRY PIT FLOUR CONSISTING OF FINELY GROUND CHERRY HULLS AND CHERRY KERNELS

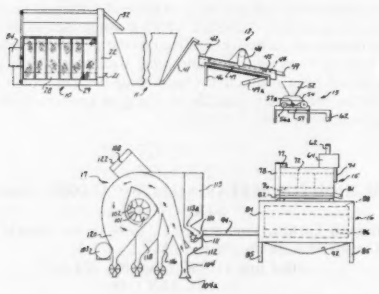
George J. Baudhuin, Sturgeon Bay, Wis., assignor to Beatrice Foods, Co., Chicago, Ill.

Division of Ser. No. 696,520, Jan. 9, 1968, Pat. No. 3,594,182.

This application Mar. 26, 1971, Ser. No. 128,538

Int. Cl. A21d *1/00;* **A23l** *2/00*

U.S. Cl. 426—148 **1 Claim**



Drying cherry pits and removing any residue of cherry flesh therefrom. Sizing the cherry pits into generally uniform sizes, cracking with controlled pressure so that the portion of the cherry hull adjacent the line of separation is cracked into pieces and the remainder into smaller pieces, and removing the larger pieces of the cherry hull from the mixture. Grinding a mixture of the cherry kernels and cherry hulls to make an edible cherry pit flour.

3,821,432

BLAND AMINO ACID COMPOSITIONS

Kasheed Mohammed, East Brunswick, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed July 26, 1971, Ser. No. 166,294

Int. Cl. A23j *1/30*

U.S. Cl. 426—167 **20 Claims**

A dietary composition for supplying nitrogen nutrition is provided comprising at least one individual amino acid and an effective quantity of oil of ginger sufficient to reduce the particularly intense and obnoxious taste of the amino acids when dispersed in water. The oil of ginger uniquely interacts organoleptically to reduce the amino acid intensity without itself producing an intense ginger flavor note. The composition is suitable for being dispersed in water to obtain a beverage or may be combined with thickening agents and dispersed in water to obtain a dietary pudding. In a preferred embodiment, other nutrients such as carbohydrates, fats, vitamins and edible mineral sources are added to produce a nutritionally complete dietary composition and moderate quantities of nonginger flavoring material are added to produce an organoleptically pleasing food product.

3,821,433

PREPARATION OF AN ALCOHOL-CONTAINING POWDER

William A. Mitchell, Lincoln Park, N.J., and William C. Seidel, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 240,272, March 31, 1972.

This application Mar. 26, 1973, Ser. No. 345,143The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl. C12g *3/04*

U.S. Cl. 426—192 **4 Claims**

Flowable powders having up to 60 percent ethyl alcohol content are prepared by the sorption of the alcohol with bulked, low dextrose equivalent dextrins. The resulting products are stable when hermetically packaged and are particularly qualified as alcoholic beverage forming compositions and flavoring materials.

3,821,434

METHOD FOR PRODUCING A COFFEE CONCENTRATE

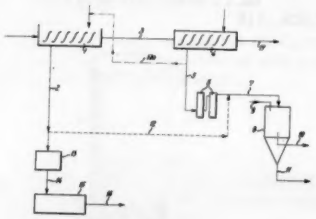
Erik Houghton-Larsen, Fredensborg, and Ove Emil Hansen, Vaerlose, both of Denmark, assignors to Aktieselskabet Niro Atomizer, Soborg, Denmark

Filed June 25, 1971, Ser. No. 156,747

Claims priority, application Denmark, July 1, 1970, 3418/70; July 1, 1970, 3419/70

Int. Cl. B01d *9/04*

U.S. Cl. 426—193 **10 Claims**



A method for producing a high grade frozen coffee extract in an economical way by extracting with a yield of between 14–29 percent and deep freezing said extract. The residual can be used for making coffee powder, e.g. by spray-drying.

Different batches of coffee concentrate can be frozen and packed in different packages according to strength and taste offering the consumer a free choice.

3,821,435
DEHYDRATED VEGETABLES

Anthony Blake, Ravensden, and Sidney Pendlington, Bromham, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 766,319, Oct. 9, 1968, abandoned. This application Feb. 22, 1971, Ser. No. 117,816
Claims priority, application Great Britain, Oct. 17, 1967, 47235/67
Int. Cl. A23p 1/40
U.S. Cl. 426—199 9 Claims

The reconstitution time of pieces of dried vegetable in a dry vegetable soup is reduced by reconstituting the dry soup in the presence of an alkali metal citrate, which complexes calcium and magnesium ions.

3,821,436
FOOD-FLAVOR-COMPOSITION

William Grant Fry, Worthington, Ohio, assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 164,455, July 20, 1971, abandoned. This application Aug. 2, 1973, Ser. No. 385,021
Int. Cl. A23l 1/26
U.S. Cl. 426—213 7 Claims

A food composition useful as a flavorant comprising a free-flowing, non-hygroscopic, water-soluble powder consisting of in combination a starch hydrolysate, preferably having a D. E. less than about 40, and at least one flavoring agent. Said food composition may also contain an anti-caking agent such as silica, a fat source and a protein source as well as other ingredients such as an edible emulsifier and a coloring agent.

3,821,437
METHOD FOR THE PREVENTION OF PHOTODISCOLORATION OF RED MEAT

Adam Heller, Sharon, Mass., and Kirby N. Klump, Pittsburgh, Pa., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 13, 1972, Ser. No. 305,992
Int. Cl. A23b 1/00
U.S. Cl. 426—265 1 Claim

A process for the preservation of the natural red color of meat wherein the surface of the red meat product is treated with a solution of beta-carotene. When red meat is so treated, it has been found that the discoloration of the natural red meat color is retarded.

3,821,438
METHOD FOR IMPARTING PINK COLOR TO CURED MEATS

William D. Brown, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed June 28, 1972, Ser. No. 267,138
Int. Cl. A23b 1/02
U.S. Cl. 426—266 3 Claims

Hexyl nicotinate or N,N-diethylnicotinamide are found to give a persistent pink color to cured meats either when employed alone or along with nitrite salts in amounts of about 10 to 20 ppm, while trigonelline or methyl nicotinate are found to be similarly useful when employed with like small amounts of the nitrite salts.

3,821,439
COAGULATING AND HARDENING BATH FOR EDIBLE COLLAGEN SAUSAGE CASINGS

Mauj A. Cohly, Danville, Ill., and A. F. Turbak, Convent Station, N.J., assignors to Tee-Pak, Inc., Chicago, Ill.

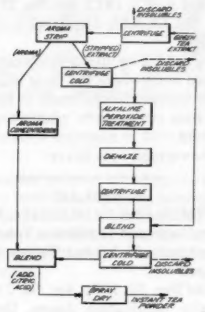
Filed Feb. 20, 1973, Ser. No. 333,828
Int. Cl. A22c 13/00
U.S. Cl. 426—277 7 Claims

An improved process for coagulating and hardening an aqueous collagen slurry for the manufacture of edible collagen casings comprises extruding the slurry into an aqueous solution having a pH of from about 8 – 11 and containing at least about 5% by weight of an alkali metal salt of strong acid, e.g., sodium sulfate, and from about 1 percent by weight of an alkali metal salt of a weak acid, e.g., sodium carbonate, for a time sufficient to effect substantial precipitation, dehydration, and neutralization of the gel collagen to form casing film having a high rewet strength.

3,821,440
PROCESS FOR THE PREPARATION OF AN INSTANT TEA POWDER

Brian Eldred Reeve, 35 Marford Hill, Marford, Wales

Filed Apr. 24, 1972, Ser. No. 246,958
Claims priority, application Great Britain, Apr. 26, 1971, 11331/71
Int. Cl. A23f 3/00
U.S. Cl. 426—312 12 Claims



An instant tea powder of low bulk density rehydratable in hot or cold water to form a clear black tea beverage is prepared by combining an extract of green or partly fermented tea with a tea extract obtained by oxidising in alkaline solution the water soluble constituents of green or partly fermented tea and drying the combined extract.

3,821,441
METHOD FOR MAKING A FROZEN CAKE

Tsutomu Tomita, Yachiyo; Masahiko Mizukoshi, Funabashi; Shinichi Ogiwara, Funabashi, and Ayahiko Maeda, Funabashi, all of Japan

Filed May 8, 1972, Ser. No. 250,952
Claims priority, application Japan, May 10, 1971, 46-30935
Int. Cl. A21d 13/08
U.S. Cl. 426—343 2 Claims

A frozen cake article is made by kneading together as principal ingredients, egg, sugar and wheat flour, together with cake making adjuncts, to form a dough and then steaming the dough in a steaming vessel to obtain a steamed cake and finally freezing the steamed cake at a temperature of −50°C. to −10°C.

3,821,442
EMULSIFIER FOR FROZEN CONFECTIONS

Ira A. MacDonald, Prior Lake, Minn.; Richard R. Egan, Worthington, Ohio, and Sidney B. Lampson, Hinsdale, Ill., assignors to Ashland Oil, Inc., Houston, Tex.

Filed Nov. 20, 1970, Ser. No. 91,517
Int. Cl. A23g 5/00
U.S. Cl. 426—356 6 Claims

Improving frozen confections as to whippability, texture, dryness and stiffness by using as the emulsifier ethoxylated partial glycerol esters of C_{10}–C_{24}fatty acids or mixtures thereof.

3,821,443

NUTRITIOUS FILLING COMPOSITION AND PRODUCT

Paul D. Halladay, Battle Creek, Mich., and John W. Dougherty, Kankakee, Ill., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 28, 1972, Ser. No. 284,311
Int. Cl. A23g *3/00*
U.S. Cl. 426—93 **9 Claims**

The invention relates to a cereal bar containing at least one layer composed of a farinaceous ingredient and at least one layer composed of a nutritious filling composition. The filling is composed basically of a mixture of an oil normally liquid at body temperatures, sugar, and a synergistic combination of protein source, namely, soy protein and egg white solids.

3,821,444

INHIBITION OF WARMED-OVER FLAVOR IN MEATS

Kunito Sato, Chicago, and Gerald R. Hegarty, Elmhurst, both of Ill., assignors to Armour and Company, Chicago, Ill.

Filed Aug. 4, 1972, Ser. No. 278,061
Int. Cl. A22c *18/00;* **A23l** *1/22*
U.S. Cl. 426—175 **11 Claims**

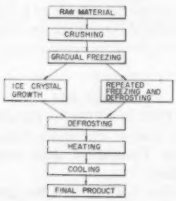
A method for inhibiting the development of warmed-over flavor in uncured meat where the meat is cooked, cooled and stored at above freezing temperature in the presence of certain gamma-pyrone compounds, after which the stored meat may be consumed cold or reheated without the development of objectionable warmed-over flavor.

3,821,445

METHOD FOR PROCESSING MEATS

Eijiro Okamura, Anjo, and Toshikatsu Takahashi, Tokyo, both of Japan, assignors to Nippon Suisan Kabushiki Kaisha, Tokyo-to, Japan

Filed Dec. 28, 1971, Ser. No. 212,984
Claims priority, application Japan, Dec. 26, 1970, 45-126005
Int. Cl. A22c *18/00, 21/00, 25/00*
U.S. Cl. 426—370 **3 Claims**



Grain-sized pieces of meat or chopped meat or fish or mixtures of fish and animal meat can be processed into a solid mass of meat which is very similar to ordinary animal meat in outer appearance as well as mouth feel, wherein the raw meat material is mixed with a quantity of salt and other additives, and then subjected to gradual freezing followed by defrosting and re-freezing operations to denature said solid mass of meat, the defrosting and re-freezing operations being conducted at least once.

3,821,446

PROCESS FOR PRODUCING DRIED, POTATO-CONTAINING ANIMAL FOOD SUPPLEMENT

Bernard A. Estey, RFD No. 1, Mapleton, Maine 04757; Charles S. Estey, RFD No. 2, Presque Isle, Maine 04769, and Owen S. Estey, RFD No. 1, Mapleton, Maine 04757

Filed Aug. 6, 1971, Ser. No. 169,800
Int. Cl. A23b *7/03*
U.S. Cl. 426—373 **12 Claims**

An animal food supplement composition is made from dehydrating potato-containing material, such as raw, fried, cooked or scrap potatoes, having a water content of about 75–90% by weight and hydrated lime as a binding agent. The potato-containing material is masticated and the lime added. The resultant mixture is ground and a portion of the final product is recycled and added to reduce the water content to about 60–65% by weight. The product is then dried to a water content of 5–10% by weight, and rapidly cooled.

3,821,447

METHOD FOR PRODUCING STABILIZED COFFEE AROMAS

George A. Jasovsky, Bayonne, N.J.; Wilfred L. Rappaneau, Dobbs Ferry, N.Y.; Gaetano J. De Ceglie, Palisades Park, and Anthony T. Nacci, Bergenfield, both of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 12, 1972, Ser. No. 252,883
Int. Cl. A23f *1/08*
U.S. Cl. 426—386 **4 Claims**

Coffee aromas such as grinder gas are collected during the processing of coffee beans and are absorbed on or are condensed and added to an edible glyceride, such as an oil. This blend is processed to remove excess water and is then mixed with an aqueous solution (e.g., coffee extract) or dry soluble coffee. The aromatized glyceride may be frozen and ground into particulate matter prior to being mixed with the solution or soluble coffee.

3,821,448

PROCESS FOR IMPROVING THE FLAVOR STABILITY OF PEANUT BUTTER

Wilbur Allen Parker, Somerville, N.J.; Guillermo German Bordt, Pleasant Hill, and Holger Larsen, Kensington, both of Calif., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Dec. 21, 1971, Ser. No. 210,554
Int. Cl. A23l *1/38*
U.S. Cl. 426—397 **5 Claims**

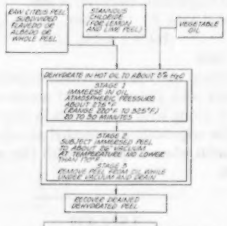
A process for improving the flavor stability of peanut butter comprising holding peanut butter under vacuum with mild agitation to deaerate the peanut butter, and packing the peanut butter under nitrogen.

3,821,449

METHOD OF DEHYDRATING CITRUS PEEL

Horton E. Swisher, Upland, Calif., assignor to Sunkist Growers, Inc., Sherman Oaks, Calif.

Continuation-in-part of Ser. No. 689,908, Dec. 12, 1967, abandoned. This application Feb. 26, 1971, Ser. No. 119,334
Int. Cl. A23b *7/02*
U.S. Cl. 426—438 **5 Claims**



Raw fresh citrus peel is immersed in hot vegetable oil and under atmospheric pressure to partially dehydrate the peel.

Vacuum is then applied to further dehydrate the peel to a moisture content of 15 percent or less, and the peel is then separated from the oil and drained. In some instances the dehydrated peel is finally impregnated with a hardenable polyol-sugar composition.

3,821,450

METHOD FOR ROASTING AND COOLING GRANULAR MATTER SUCH AS COFFEE

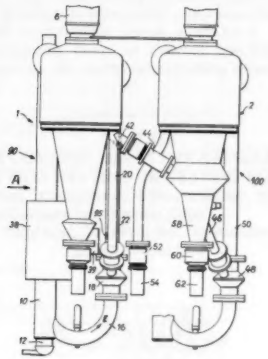
Siegfried Stauber, Zurich, Switzerland, assignor to Firma E. Osswald, Zurich, Switzerland

Continuation-in-part of Ser. No. 801,718, Feb. 24, 1969, abandoned. This application July 12, 1971, Ser. No. 161,830

Claims priority, application Switzerland, Feb. 29, 1968, 2971/68

Int. Cl. A23s *1/02*

U.S. Cl. 426—467 **4 Claims**



A method for roasting and cooling granular material, especially coffee beans, wherein a circulating gas stream is generated in a first closed system and the material to be roasted is also circulated by means of said circulating gas stream through said first closed system. The material is heated in the first closed system during its circulation therethrough, and the pressure within the first closed system is increased beyond atmospheric pressure by heating the circulating gas stream circulating the material to be roasted, heating of the circulating gas stream causing heating of the material and evolving gases from the heated material containing aroma constituents and primarily water vapor. The material is roasted in said first closed container system due to such heating thereof, with the increasing pressure within said first closed system being due to the heating of the circulating gas stream circulating the material and the attendent heating of the latter. Impurities lighter than the material roasted at said first closed system are separated, and upon completion of roasting the roasted material together with the gas stream containing the aroma constituents of the roasted material are transferred into a second closed system. The material and the gas stream are then cooled in said second closed system to relieve the pressure thereof.

3,821,451

DEHULLING RAPE SEED

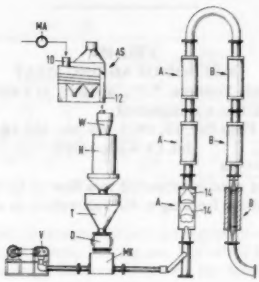
Leslie Palyi, 23 Larahee Crescent, Don Mills, Ontario, Canada

Filed Oct. 13, 1971, Ser. No. 188,797

Claims priority, application Germany, July 14, 1971, 2135173

Int. Cl. A23l *9/00*

U.S. Cl. 426—483 **6 Claims**



Rape seed is dehulled without oil being extracted from the kernels thereof by a method comprising heating the rape seed to about 45°C, cooling it with a current of cold air which carries it to impact against a surface to crack the hulls thereof and separating the hulls therefrom by moving said current past friction applying means.

3,821,452

PROCESS FOR THE CONTINUOUS PRODUCTION OF MULTI-LAYERED FOOD MATERIAL

Torahiko Hayashi, 2-3 Nozawa-cho, Utsunomiya, Japan

Filed Feb. 19, 1971, Ser. No. 116,895

Claims priority, application Japan, Feb. 24, 1970, 45-15254

Int. Cl. A21d *13/08*

U.S. Cl. 426—502 **7 Claims**

A process for the continuous production of multilayered food material, which consists substantially in feeding a dough of uniform thickness which covers fat, paste or other inner material onto a movable base. The base is located beneath a press, which compresses the fed materials into a predetermined thickness. The press is actuated in synchronization with the feed of the materials and the movement of the base is variable as to its velocity.

3,821,453

PROTEIN FIBER FORMING

Ralph A. Hoer, Ballwin, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 825,979, May 19, 1969, Pat. No. 3,662,672. This application Apr. 7, 1972, Ser. No. 242,198The portion of the term of this patent subsequent to May 16, 1989, has been disclaimed.

Int. Cl. A23j *3/00;* **A23l** *1/20*

U.S. Cl. 426—506 **17 Claims**

A process of continuously forming tender textured protein structures is disclosed. The structures are formed from an

aqueous slurry of a proteinaceous material having a solids content of up to about 35 percent by weight. The proteinaceous solids should be of a fairly high purity. The proteinaceous slurry is formed into textured filaments or fibers by continuously heating the slurry under pressure and cooling the slurry. The texture of the protein structures can be readily controlled by the process conditions, starting material, or reagents used in the process.

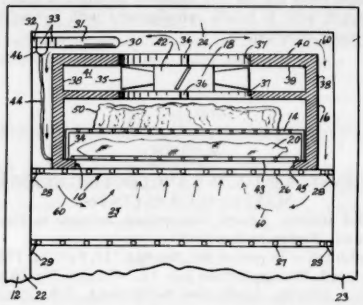
3,821,454

METHOD OF AGEING MEAT

Stanley Lobel, Yonkers, N.Y., assignor to Leon Lobel, New Hyde Park, Pa.; a part interest

Filed Dec. 15, 1971, Ser. No. 208,164
Int. Cl. A22c *18/00*
U.S. Cl. 426—524 **1 Claim**

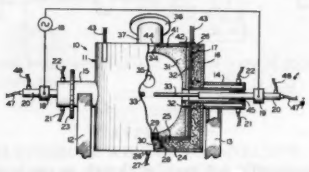
Meat to be aged is subjected to a flow of air at a temperature of just above freezing to 40° Fahrenheit. In a modification the moisture content of the air is lowered below that of the surrounding air. The means for utilizing the method comprise



means to support the meat in a housing which directs the flow of air, and means to force the flow of air about the meat.

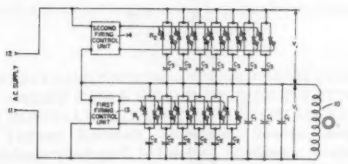
ELECTRICAL

3,821,455
INDIRECT ARC METAL MELTING FURNACE
Herbert Greenewald, Jr., 4296 Braunton Rd., Upper Arlington, Ohio 43220
Continuation-in-part of Ser. No. 151,937, June 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 24,490, April 4, 1970, abandoned. This application Apr. 27, 1973, Ser. No. 355,285
Int. Cl. H05h *1/00*; H05b *7/18*
U.S. Cl. 13—9 **6 Claims**



An indirect arc metal melting furnace employing an ionizable interior atmosphere is provided with a sealed and insulated double shell construction which is effective to minimize moisture outgassing from an internal crucible lining and thereby improves the electrical operating characteristics of the furnace.

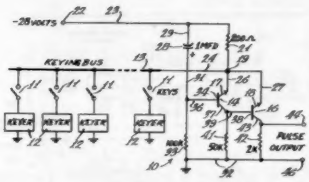
3,821,456
POWER CONTROL MEANS FOR A SINGLE PHASE INDUCTION MELTING OR HEATING FURNACE
George Havas, Youngstown, Ohio, assignor to Ajax Magnethermic Corporation, Warren, Ohio
Filed Sept. 24, 1973, Ser. No. 400,034
Int. Cl. H05b *5/04*
U.S. Cl. 13—26 **5 Claims**



There is disclosed herein a circuit for controlling the voltage and power delivered to a single phase induction melting or heating furnace wherein the impedance of the furnace varies. The circuit utilizes selected and controllable capacitors as control means.

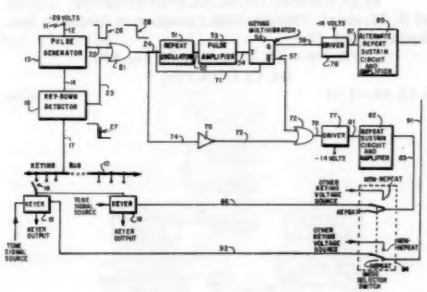
3,821,457
PULSE GENERATOR FOR USE WITH AN ELECTRICAL MUSICAL INSTRUMENT
Adelore F. Petrie, Arlington Heights, and Wilford R. Schreier, Bensenville, both of Ill., assignors to Hammond Corporation, Deerfield, Ill.
Filed June 11, 1973, Ser. No. 368,818
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **5 Claims**

In an electrical musical instrument of the keyboard type such as an electronic organ having selectively played keys for connecting corresponding tone generator keyers to a source of keying voltage, a voltage differential triggered monostable multivibrator pulse generator operable to produce an electrical pulse upon playing any one of the keys, the pulse generator being especially suitable for operating, simultaneously with key actuations, a unitary instrumental or percussive rhythm voice generator common to all of the keys in order to provide a pleasing musical effect. The pulse generator includes a



sensing means in integral circuit arrangement with the keys and the voltage source. Playing any one of the keys serves to produce a voltage differential across the sensing means to trigger the monostable multivibrator pulse generator to produce a pulse output of predetermined duration regardless of the number of keys already being played.

3,821,458
REPETITIVE KEYER ACTUATING CIRCUIT FOR AN ELECTRICAL MUSICAL INSTRUMENT
Wilford R. Schreier, Bensenville, Ill., assignor to Hammond Corporation, Deerfield, Ill.
Filed June 11, 1973, Ser. No. 368,877
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.13 **10 Claims**

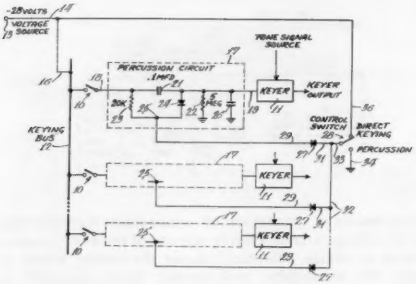


In an electrical musical instrument of the keyboard type having a plurality of selectively played keys for connecting corresponding tone generator keyers to a source of keying voltage, a repetitive keyer actuating circuit operable in response to key playing to produce electrical keying pulses for alternately and repeatedly actuating two sets of keyers. The repetitive keyer actuating circuit comprises a keying pulse generator in circuit with the voltage source and the keys and operable in response to key playing to alternately and repeatedly provide at each of two outputs keying pulses at regular preselected time intervals, and keying pulse sustain circuits each in corresponding circuit arrangement with one of said outputs and a set of keyers and operable to produce multiple stage envelope decay for said keying pulses. Each set of keyers is actuated by an initially percussive and subsequently sustained keying pulse to provide musically satisfactory repeatable effects throughout the range of keying pulse frequencies.

3,821,459
PERCUSSION TO DIRECT KEYING SWITCHING CIRCUIT FOR AN ELECTRICAL MUSICAL INSTRUMENT

Ray B. Schrecongost, Park Ridge, Ill., assignor to Hammond Corporation, Deerfield, Ill.

Filed June 11, 1973, Ser. No. 368,879
Int. Cl. G10h 1/02
U.S. Cl. 84—1.13 5 Claims

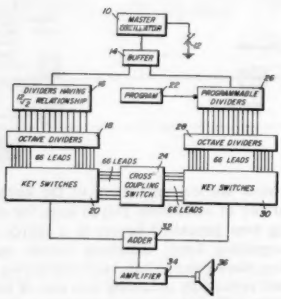


In an electrical musical instrument having a plurality of selectively played keys each for connecting a tone generator keyer to a source of keying voltage through a related percussion keyer circuit, a percussion to direct keying switching circuit for selectively providing percussion and direct keying operation of all of the tone generator keyers by operation of a single control switch.

3,821,460
ELECTRONIC MUSICAL INSTRUMENT

Fred B. Maynard, Phoenix, Ariz., assignor to Motorola Inc., Franklin Park, Ill.

Filed Nov. 15, 1972, Ser. No. 306,639
Int. Cl. G10h 3/06
U.S. Cl. 84—1.17 5 Claims

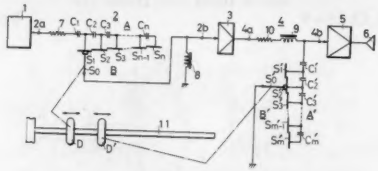


An electronic organ usable for educational purposes includes a first tone generating circuit for generating the equal tempered musical scale and a second programmable tone generating circuit for simultaneously generating a second musical scale such as a Just, Pythagorean, mean tone or other scale. Separate keyboards are provided to allow a direct comparison of the tonal characteristics of the various scales. The programmable tone generating circuit utilizes programmable digital dividers with switchable feedback taps to allow the generating circuit to be rapidly tuned to any desired scale.

3,821,461
TONE GENERATOR CIRCUIT FOR ELECTRIC OR ELECTRONIC MUSICAL INSTRUMENTS

Fumio Mieda, Saitama, Japan, assignor to Keio Giken Kogiyo Kabushikikaishiya, Tokyo, Japan

Continuation of Ser. No. 162,978, July 15, 1971, abandoned. This application Dec. 26, 1972, Ser. No. 318,681
Claims priority, application Japan, July 30, 1970, 45-75717[U]
Int. Cl. G10h 1/02
U.S. Cl. 84—1.19 12 Claims

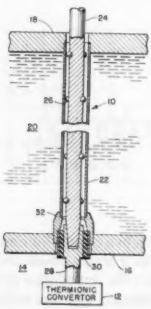


A tone generator circuit for electric or electronic musical instruments, having a band-pass filter circuit inserted in a transmission line for transmitting an electric sound from an electric sound source to a speaker and knobs for adjusting the upper and lower cutoff frequencies of the band-pass filter circuit, the knobs being slidably mounted on a guide member in such a manner that either one of them may always lie on a predetermined side of the other.

3,821,462
HIGH CURRENT ELECTRICAL LEAD

Warner B. Kaufman, Broadview Heights, and Roland Breitwieser, Fairview Park, both of Ohio, assignors to VEB Filmfabrik Wolfen, Wolfen, Germany

Filed July 19, 1972, Ser. No. 273,222
Int. Cl. H01b 9/04
U.S. Cl. 174—15 C 6 Claims



An electrical lead has insulators imbedded in an inner conductor rod to form an annulus between the rod and a surrounding outer sheath. This annular space is filled with gas which conducts heat and prevents electrical leakage.

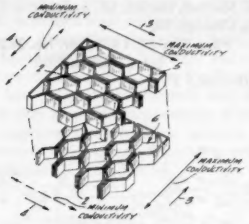
3,821,463
ELECTROMAGNETIC SHIELDING MATERIAL

Wilem F. Bakker, Piscataway, N.J., assignor to Metex Corporation, Edison, N.J.

Division of Ser. No. 17,121, March 6, 1970, abandoned. This application Mar. 7, 1972, Ser. No. 232,584
Int. Cl. H05k 9/00
U.S. Cl. 174—35 MS 7 Claims

The electromagnetic shielding material is comprised of at least a first layer and a second layer, each layer being com-

posed of a honeycomb material having a longitudinal axis. The longitudinal axis of the second layer is disposed at an angle



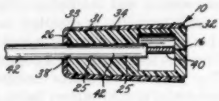
relative to the longitudinal axis of the first layer of greater than 0° but less than 180°.

3,821,464

ELECTRICAL WIRE END CONNECTOR

Maxwell H. Connan, 240 Glen Head Rd., Glen Head, N.Y. 11545

Filed Nov. 17, 1972, Ser. No. 307,591
Int. Cl. H02g *15/08*
U.S. Cl. 174—87 **1 Claim**



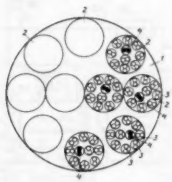
A mechanical end connector for covering and maintaining the bared ends of twisted electrical conductors. The device includes a hingedly interconnected inner clamp element of tapered configuration, and a surrounding correspondingly tapered sleeve into which the clamp element is wedged to a point where interlocking means are engaged to prevent removal without cutting or destroying the sleeve element.

3,821,465

TELECOMMUNICATION CABLE, PARTICULARLY PAIRED CABLE WITH IMPROVED RELATIVE CROSSTALK PROPERTIES FOR CERTAIN PAIRS

Sten Lennart Karlstedt, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Feb. 20, 1973, Ser. No. 334,137
Claims priority, application Sweden, Mar. 2, 1972, 2654/72
Int. Cl. H01b *11/10*
U.S. Cl. 174—113 R **1 Claim**



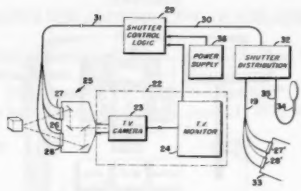
A paired or quadded telecommunication cable have conductors arranged in groups. One pair or quad within each group does not change place and is shielded by the other pairs or quads within the group resulting in a high relative freedom of crosstalk.

3,821,466

LIQUID CRYSTAL STEREOSCOPIC TELEVISION SYSTEM

John A. Roese, 6315 Camino Corto, San Diego, Calif. 92120

Filed May 25, 1973, Ser. No. 364,212
Int. Cl. H04n *9/54*
U.S. Cl. 178—6.5 **12 Claims**



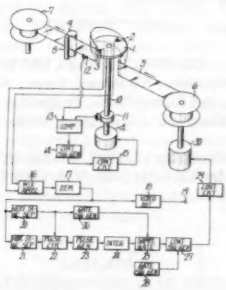
An underwater viewing system is mounted on a submarine vehicle and includes a stereoscopic viewing system. The stereoscopic viewing system comprises a single camera having a full-frame beam-splitter which is equipped with electro-optical light valves. The remote viewing station provides a full-frame alternate-image readout for the stereoscopic viewing system and is provided with a head-worn stereoscopic analyzer having electro-optical light valves which are synchronized with those on camera.

3,821,467

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Kazuo Iketaki, Kanagawa, and Kazuo Hashizaki, Tokyo, both of Japan, assignors to Sony Corporation, Shinagawa-ku, Tokyo, Japan

Filed Dec. 16, 1971, Ser. No. 208,629
Claims priority, application Japan, Dec. 19, 1970, 45-114841
Int. Cl. H04n *5/78*
U.S. Cl. 360–70 **8 Claims**

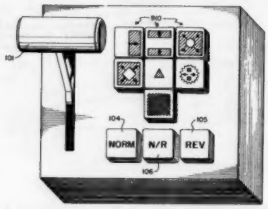


A control system for a video tape reproducing apparatus having a rotary magnetic head assembly to scan the tape obliquely. The system compensates for phase distortions, known as jitter components, in the reproduced video signal and mainly caused by variations in tape tension during the reproduction. A phase distortion sensing means detects the time interval between a first reference signal in a part of the reproduced signal just before the end portion of one oblique track on the tape and a second reference signal in a part of the reproduced signal at or shortly after the beginning portion of the next track on the tape, and generates a control signal corresponding to the time interval. The control signal is used for controlling tape tension to compensate for phase distortions in the reproduced video signal.

3,821,468
DIGITAL SPECIAL EFFECTS GENERATOR

Albert E. Busch, Bloomington, Ind., assignor to Sarkes Tarzian Inc., Bloomington, Ind.

Continuation-in-part of Ser. No. 236,834, March 22, 1972, abandoned. This application July 23, 1973, Ser. No. 381,827
Int. Cl. H04n *5/22*
U.S. Cl. 178—6.8 **58 Claims**

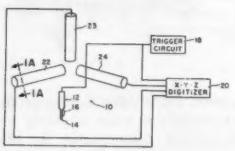


A special effects generator constructed primarily from digital hardware combines two input video signals into a single output video signal under the control of a lever control, counter, or digital computer. Horizontal, vertical, and diagonal wipes may be achieved, as well as exploding circular and elliptical wipes and many other highly unusual effects. The generator includes a horizontal digital counter the count output of which indicates the horizontal position of a scanning spot in the output video signal and a vertical digital counter the output of which indicates the vertical position of the scanning spot. An analog-to-digital converter presents a count proportional to the setting of the lever control. Alternatively, this count value may be generated by a manually controlled counter or by a computer. Digital computational circuitry including squaring circuitry is provided for processing these digital counts in various ways, and the resultant computed digital outputs are compared by one or more digital comparing circuits or comparators. The comparing circuit outputs then serve as a criterion for determining which of two input video signals is to be used in constructing the output video signal at any given moment.

3,821,469
GRAPHICAL DATA DEVICE

Albert L. Whetstone, Southport, Conn.; Samuel Fine, New City, N.Y., and Robert Davis, Prospect, Conn., assignors to Amperex Electronic Corporation, Hicksville, Long Island, N.Y.

Filed May 15, 1972, Ser. No. 253,417
Int. Cl. G01s *3/80, 5/16;* **G08c** *21/00*
U.S. Cl. 178—18 **3 Claims**

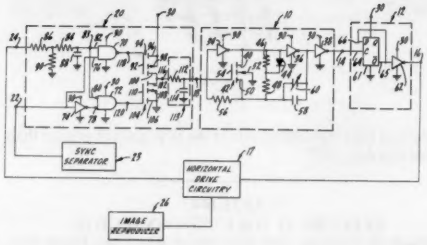


A graphical data device employing a stylus moving through a cubic space to be digitized and utilizing a fast rise time sound energy shock wave, generated by a spark at the location of the stylus and propagated through the air for providing three dimensional coordinate information as to the instantaneous position of the spark. Receiver devices are positioned along X, Y and Z coordinates and respond to the leading edge of the air propagated shock wave front to provide an elapsed time indication from the moment of spark generation to the moment of shock wave reception.

3,821,470
PHASE CORRECTION FOR HORIZONTAL OSCILLATOR IN CMOS FORM

Richard G. Merrell, Darien, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed May 21, 1973, Ser. No. 362,647
Int. Cl. H04n *5/08*
U.S. Cl. 178—69.5 TV **7 Claims**

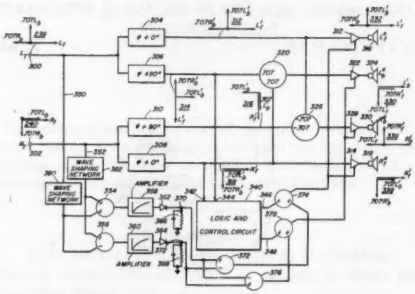


A horizontal oscillator system in CMOS form, for use in a television receiver, comprising an oscillator connected to a divider-buffer stage and a phase comparator; the output of the divider-buffer stage is applied to the horizontal drive circuitry of the television receiver and the flyback signal produced by the horizontal drive circuitry is coupled back to the phase comparator, which includes a positive-logic channel and a negative-logic channel terminating in a complementary pair of MOS-FET's. The phase comparator compares the flyback signal with a horizontal synchronizing pulse derived from the sync separator of the television receiver, and develops a control voltage varying in amplitude in response to changes in phase of the flyback signal and the horizontal sync pulse. The control voltage is applied to the oscillator so as to control the operating frequency and thereby maintain the oscillator frequency in synchronism with the horizontal sync pulse.

3,821,471
APPARATUS FOR REPRODUCING QUADRAPHONIC SOUND

Benjamin B. Bauer, Stamford, Conn., assignor to CBS Inc., New York, N.Y.

Filed Mar. 15, 1971, Ser. No. 124,135
Int. Cl. H04n *5/00*
U.S. Cl. 179—1 GQ **12 Claims**



Apparatus for decoding four separate channels of information transduced from a medium having only two channels and presenting them on four loudspeakers to give the listener the illusion of sound coming from a corresponding number of separate sources. The realism is enhanced by a decoding

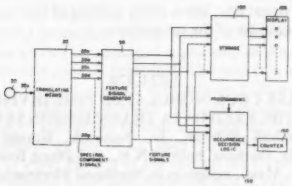
system which accepts the two outputs from the medium, which may be a disc record, decodes them into four independent channels each carrying as predominant components the information contained in the originally recorded sound signals, and which includes a logic and control circuit and a "front-back" logic for controlling the gains of amplifiers associated with the four loudspeakers. The logic and control circuit utilizes a wave-matching technique for improving the separation of the four independent channels, and the "front-back" logic, which may be used independently of the "wave-matching" logic, improves the separation between generally "front" and generally "back" signals, thereby to enhance the realism of the quadraphonic reproduction.

3,821,472

COUGH MONITORING APPARATUS

Marvin B. Herscher, Camden, and Thomas B. Martin, Burlington, both of N.J., assignors to Threshold Technology Inc., Cinnaminson, N.J.

Filed Feb. 25, 1972, Ser. No. 229,290
Int. Cl. G10l *1/04*
U.S. Cl. 179—1 SA **5 Claims**



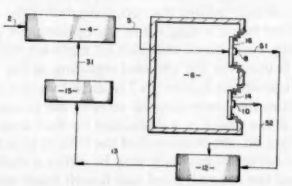
An apparatus that receives ambient sounds and recognizes the occurrence of coughs to the exclusion of other sounds. Means are provided for translating the received sounds into a plurality of spectral component signals. A feature signal generating means is provided for sensing the presence of properties of the spectral component signals that are characteristic of coughs and for generating a feature signal for each property found to be present. An occurrence decision means, responsive to the feature signals, generates an occurrence indication upon receiving a predetermined combination of feature signals. In a preferred embodiment of the invention, the occurrence decision means is programmable to the cough of a particular individual.

3,821,473

SOUND REPRODUCTION SYSTEM WITH DRIVEN AND UNDRIVEN SPEAKERS AND MOTIONAL FEEDBACK

Joe H. Mullins, 20 Oaklawn Rd., Fair Haven, N.J. 07701

Continuation-in-part of Ser. No. 835,033, June 20, 1969, abandoned. This application Nov. 10, 1971, Ser. No. 197,405
Int. Cl. H04r *3/00*
U.S. Cl. 179—1 F **5 Claims**



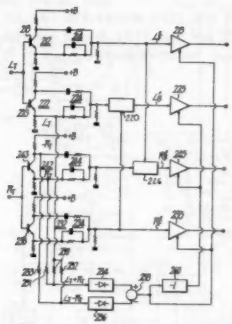
A High fidelity sound reproduction system comprising an amplifier, an enclosure, a driven speaker mounted in the enclosure and at least one undriven speaker mounted in the enclosure. Each of the speakers mounted in the enclosure have different resonant frequencies and motional feedback devices attached thereto. The outputs of the motional feedback device are combined to produce a negative feedback signal to the amplifier.

3,821,474

APPARATUS FOR REPRODUCING QUADRAPHONIC SOUND

Mitsuo Ohsawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 19, 1972, Ser. No. 264,030
Claims priority, application Japan, June 21, 1971, 46-44622
Int. Cl. H04r *5/00*
U.S. Cl. 179—1 GQ **5 Claims**



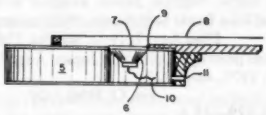
Two input terminals are separately supplied with a first and a second composite signals, each of which contains at least three signal components having predetermined phase-relationships with one another, a plurality of all-pass phase-shifting networks operative to position the first and second composite signals in phase quadrature with respect to each other are connected to the input terminals, combining networks operative to deliver four output signals, each of which contains a separate dominant signal component, are connected to the all-pass phase-shifting networks. The apparatus further provides separate phase-inverters in the respective all-pass phase-shifting networks to deliver phase-inverted composite signals therefrom, means to sum select portions of the first and second composite signals, means for producing a signal representative of the difference of select portions of the first and second composite signals derived from the phase inverters, and means for comparing the sum and difference signals to produce a signal for controlling the gain of the output signals.

3,821,475

SOUND ENHANCEMENT SPEAKER ENCLOSURE

John C. McKechnie, 2300 Mohawk Trl., Maitland, Fla. 32751

Filed July 18, 1972, Ser. No. 272,992
Int. Cl. G10k *13/00*; **H04r** *1/28*
U.S. Cl. 179—1 M **1 Claim**



An audio speaker enclosure for restoring characteristics of a stringed musical instrument when replayed from a recorder or from another source.

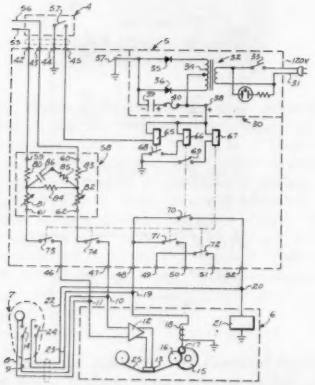
Sounds as represented by electrical signals are applied to a speaker which is mounted in the acoustical opening common to this type of musical instrument. Sympathetic vibrations, including audio tones and overtones are added by a novel speaker enclosure identical to the original musical source instrument.

3,821,476

DICTATING MACHINE-TELEPHONE CONNECTOR LINK

Truman D. Godwin, 3312 20th St., Lubbock, Tex. 79410

Filed July 28, 1972, Ser. No. 275,921
Int. Cl. H04m *1/64*
U.S. Cl. 179—6 R **7 Claims**



A connector link for connecting virtually any type of dictating machine to a telephone system to record incoming calls. The connector link is contained in a single housing, has its own power supply, and has terminals to facilitate connecting the connector link between the telephone system and an incoming call sensing device, and the dictating machine, without the need for modification of the dictating machine, telephone system or call sensing device. The connector link employs normally open switches so arranged that the dictating machine can be used in its normal fashion for microphone type voice dictation except when there is an incoming call on the telephone lines. A switch for disabling the connector link enables rejecting all incoming calls so the dictating machine can be used for dictating only. The connector link can be used to particular advantage where the incoming call sensing device is a telephone company installed recorder-coupler.

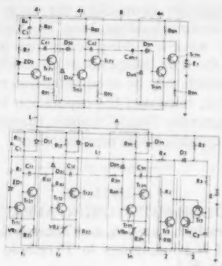
3,821,477

SYSTEM FOR MULTIPLEX TRANSMISSION OF ELECTRICAL SIGNALS UTILIZING SYNCHRONIZED RING COUNTERS

Yoichi Hotta, Nagoya, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seidakusho, Nishikasugai-gun, Japan

Filed Aug. 7, 1972, Ser. No. 278,410
Claims priority, application Japan, Aug. 7, 1971, 46-59826; Aug. 7, 1971, 46-59827
Int. Cl. H04j *3/04*
U.S. Cl. 179—15 A **13 Claims**

A system and an apparatus for multiplex transmission of electrical signals via a single signal line. In a transmitter and a receiver, "on" positions of ring counters thereof are sequentially shifted in synchronism with each other by a clock pulse generating circuit and a resetting circuit. Means are provided for converting n electrical signals to output voltages of the respective stages of n-stage ring counter in the transmitter and



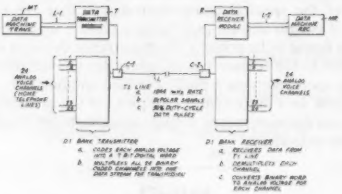
for sequentially applying said output voltages to the corresponding stages of the read counter in the receiver, through said single signal line, upon every shifting of the "on" position of the ring counter of the transmitter.

3,821,478

PULSE CODE MODULATED TIME DIVISION MULTIPLEXED DATA TRANSMISSION SYSTEM

Alfred Kimball Hillman, Jr., Suncook; Harold Frederick Wochholz, Durham, both of N.H., and Dixon Brown Penick, Andover, Mass., assignors to Northeast Electronics Corporation, Concord, N.H.

Filed Sept. 20, 1972, Ser. No. 290,765
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 AF **24 Claims**



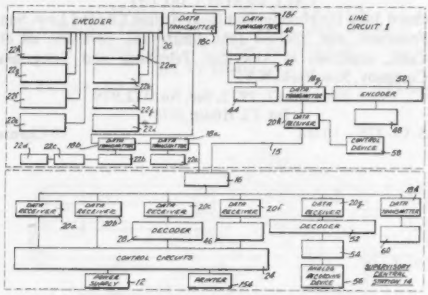
A system for transmitting a binary data stream that has a given average rate over a multiplex channel that has a higher long term rate by using stuffed bits to bring up the density of the lower average rate bit stream so that it can be transmitted at the higher rate. The lower average rate bit stream is arranged by byte blocks, with each byte block having: its own block framing bit, an optional bit position in which a stuffed bit or a data bit may be placed as required, and a plurality of control bits which inform the receiving end if the block contains a stuffed bit or a data bit in the optional bit position. In one example, each block contains six eight-bit bytes. Bit 1 of each byte is used for the channel signaling in the T1 Carrier System. Bit positions 2 through 7 of each byte are taken up by data bits from the lower rate bit stream. Bit position 8 of the sixth byte in the block is a dedicated bit that is always occupied by a data bit. Bit position 8 of the fifth byte in the block is an optional bit position which may be either a stuffed bit or a data bit, and the second, third and fourth bytes contain in bit position 8 control bits which inform the receiving end if the optional bit position of that block is occupied by a data bit or by a stuffed bit.

3,821,479

NONINTERFERING ELECTRICAL SIGNALING

David W. Campbell, Brooklyn, N.Y., assignor to American District Telegraph Company, Jersey City, N.J.

Filed Apr. 16, 1973, Ser. No. 351,660
Int. Cl. H04j 1/16
U.S. Cl. 179—15 BF 14 Claims



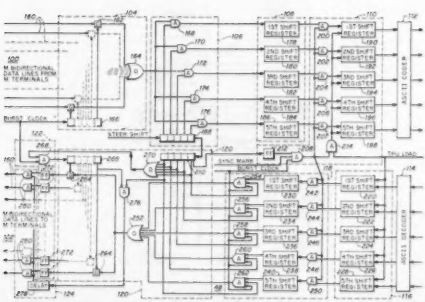
An electrical protection circuit having at least one line circuit, the line circuit consisting of a plurality of data transmitters and data receivers, is described. The data transmitters are connected in parallel across a transmission path and operate in a frequency multiplexing mode. The data receivers at a central supervisory station are connected in parallel and a deviation from normal at any of the data transmitters is recorded and stored in input circuits at the central supervisory station. A return to normal is similarly recorded and stored. The input circuits are sequentially scanned and messages are printed corresponding to the state of the input circuit. The system includes fault detecting and alarm circuitry which conditions the line circuit when a break occurs. A programmer dircuit connected to the printer provides a unique message cofresponing to each input circuit. Time discriminator units at the monitor station and the central supervisory station are provided to enable a single tone transmitter to indicate the condition of a momentary actuating device and an extended time actuating device.

3,821,480

MULTIPLEXER SYSTEM

Thomas M. Dundon, Wayland, and Terence J. Hatton, Natick, both of Mass., assignors to Datatrol, Inc., Hudson, Mass.

Filed May 29, 1973, Ser. No. 364,705
Int. Cl. H04j 3/04
U.S. Cl. 179—15 A 9 Claims



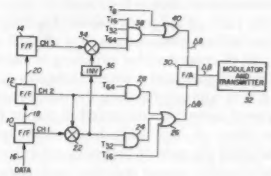
A multiplexer system for cyclically exchanging items of information with a plurality of terminals over bidirectional data lines, there being M terminals and each item of information having N parts, including scanner means for periodically scanning each of the M terminals in sequence and retrieving a one of the N parts from each terminal over a bidirectional data line during each period of a first portion of each cycle; input storage means having N storage areas each having M storage locations; first steering means for directing the M parts retrieved from each different scanning period to a different one of the N storage areas; and means for reading out one of the M parts from each of the N storage areas simultaneously to reconstruct each of the items of information transferred from each of the M terminals.

3,821,481

THREE CHANNEL PSK DATA MODEM APPARATUS

William J. Melvin, Costa Mesa, Calif., assignor to Collins Radio Company, Dallas, Tex.

Division of Ser. No. 187,675, Oct. 8, 1971, Pat. No. 3,764,743.
This application July 9, 1973, Ser. No. 377,463
Int. Cl. H04l 27/20
U.S. Cl. 179—15 R 3 Claims



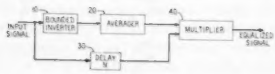
Apparatus for and the method of providing three channel, eight phase data modulation and demodulation whereby the system may be used for either two or three channels with no detrimental effects in either mode of operation due to the additional circuitry. The invention discloses additional apparatus for connection to a conventional two channel, four phase system to produce a three channel, eight phase system. The coding of the eight phase system modifies the basic phase change of a two channel, four phase system by ±2.5° depending upon the exclusive nor result of the first two channels as compared to the binary logic level of the third channel.

3,821,482

NOISE SPECTRUM EQUALIZER UTILIZING SPECTRUM INVERSION

Peter Hirsch, Parsippany, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed May 3, 1973, Ser. No. 356,919
Int. Cl. H04b 1/66
U.S. Cl. 179—15.55 R 10 Claims



Apparatus for noise spectrum equalization of applied power spectrum samples for enhancing detection of signals embedded in noise. Equalization is achieved through inversion of applied spectrum samples followed by division of each applied spectrum sample by an associated neighborhood-mean equalizing signal generated by computing the average am-

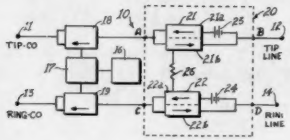
plitude of a predetermined number of inverted samples in the vicinity of the associated applied spectrum sample. The use of inverted samples in computing the equalizing signal results in noise spectrum equalization apparatus that is insensitive to the unwanted effects of strong signals.

3,821,483

TELEPHONE LINE LOOP EXTENDER

Ronald Japenga, Glendale Heights, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Oct. 17, 1972, Ser. No. 298,337
Int. Cl. H04m *3/40*
U.S. Cl. 179—16 F **5 Claims**



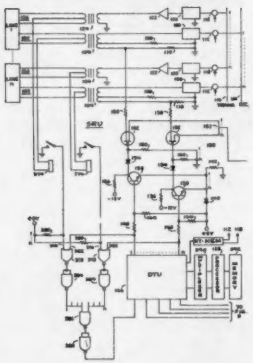
A telephone extender is disclosed herein which includes a pair of bidirectional current flow control circuit paths for connection into each of the pair of lines of a telephone line loop. Each of the bidirectional current flow control circuit paths includes a pair of cross couples switching transistors for providing one current path and a single transistor in series with an external power source providing the other current path. Only a single power source is connected in one or the other of the telephone lines. A high impedance cross coupling is connected between the pair of bidirectional current flow control circuit paths so that proper polarity conduction occurs in each circuit.

3,821,484

TIME SHARING OF A SUPERVISORY RECEIVER UNIT

Sven Y. Sternung, and Earl T. Cowden, both of Galion, Ohio, assignors to North Electric Company, Galion, Ohio

Continuation of Ser. No. 124,233, March 15, 1971, abandoned. This application Nov. 15, 1972, Ser. No. 306,842
Int. Cl. H04m *3/22*
U.S. Cl. 179—18 EB **16 Claims**



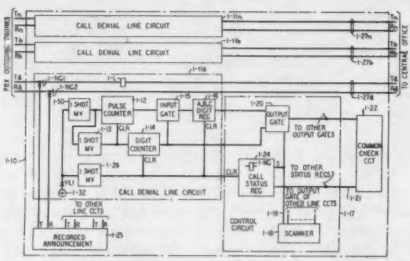
Supervisory receiver units are connected as time shared detectors to continually monitor all incoming lines and trunks of an automatic telephone system to determine the presence of supervisory tone signals, such as seize, release, recall, and acknowledge. Each supervisory receiver unit is dedicated to an associated group of eight terminals, with each terminal being monitored for a corresponding part of a scanning cycle. As the scan of each terminal is completed, the detection results are relayed to a processor. Such action continues until the entire group is scanned.

3,821,485

CALL DENIAL CIRCUIT

Richard John Harrington, Oakland; Arnold Edward Low, San Francisco, and Michael John Sturtevant, Berkeley, all of Calif., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Dec. 7, 1972, Ser. No. 312,979
Int. Cl. H04m *3/38*
U.S. Cl. 179—18 DA **10 Claims**



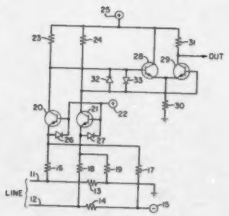
A call denial circuit is disclosed for restricting selected calls outgoing from PBXs (Private Branch Exchanges) over central office lines. It includes a call denial line circuit which registers and counts the first three digits dialed over a line as well as a continuously operating scanner which sequentially causes the registered digits and digit count of a number of line circuits to be checked by a common check circuit. The check circuit detects if restricted calls are being placed and generates restrict signals accordingly. A call status register associated with each line circuit is actuated by the scanner to register restrict signals and terminate a restricted call.

3,821,486

BRIDGE-TYPE SUPERVISORY DETECTOR WITH REDUCED BREAKDOWN VOLTAGE REQUIREMENTS

Harry Edward Mussman, Darien, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

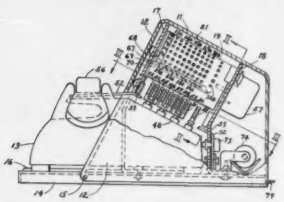
Filed June 22, 1973, Ser. No. 372,815
Int. Cl. H04m *3/22*
U.S. Cl. 179—18 FA **8 Claims**



A bridge-type supervisory detector for communication lines is provided with transistor circuits connected to each cross-arm of the bridge which provide output currents dependent upon the voltages of the respective line conductors. The

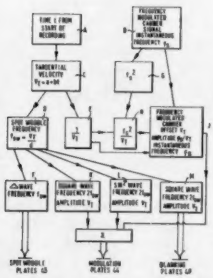
breakdown voltage requirements placed on the detector itself and upon the differential amplifier which follows are thereby reduced and both may be fabricated readily and inexpensively with presently existing thin film and integrated circuit techniques.

3,821,487
AUTOMATIC DIALING APPARATUS
Don A. Haynes, 1989 Osage Dr., Okemos, Mich. 48864
Filed May 7, 1973, Ser. No. 358,120
Int. Cl. H04m *1/44*
U.S. Cl. 179—90 AD **11 Claims**



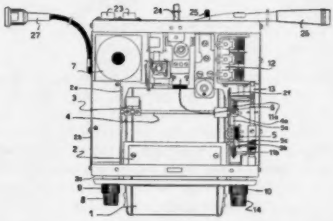
An automatic dialing apparatus for push button key telephone instruments having a rotatable cylinder provided with changeable pegs which selectively engage levers to depress the keys of a telephone instrument in any desired predetermined sequence. The automatic dialing apparatus is mounted upon the telephone instrument with its actuating levers in register with selected of the keys of the telephone instrument. The automatic dialing apparatus can be actuated by any standard emergency sensing and warning system so as to dial any desired number and/or actuate any desired type of warning device.

3,821,488
METHOD AND APPARATUS FOR MAKING MASTER RECORDS FOR DISC RECORDS BY SCANNING THERMOPLASTIC FILM WITH ELECTRON BEAM
Graham Stuart Plows, and Gordon Malcolm Edge, both of London, England, assignors to Decco Limited, London, England
Filed Apr. 25, 1972, Ser. No. 247,443
Claims priority, application Great Britain, Apr. 28, 1971, 11993/71
Int. Cl. G11b *3/00;* **H04n** *5/82*
U.S. Cl. 179—100.4 C **6 Claims**



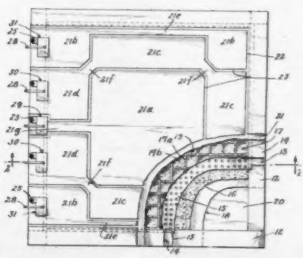
A method of recording television picture signals by scanning a spiral track on a conductively supported disc of thermoplastic material with an electron beam and heating the disc to transform the modulations of the beam into a spatially modulated groove. The beam is oscillated from side to side at a frequency which varies to ensure that charge is laid down at least twice on every point of the track and the beam is blanked at the extremities of its side-to-side movement.

3,821,489
COMBINED RADIO RECEIVER AND TAPE CARTRIDGE PLAYER FOR AUTOMOBILES
Israel Kocubej, Ruo da Consolacao n° 1595, Sao Paulo, Brazil
Filed July 29, 1969, Ser. No. 845,768
Int. Cl. G11b *31/00*
U.S. Cl. 179—100.11 **7 Claims**



A combined radio receiver and tape cartridge player for automobiles is provided with a pivotal radio tuning dial covering the receptacle for a tape cartridge and with a switch for automatically selecting the operation of the tape player or radio, actuated by the insertion or removal of the cartridge.

3,821,490
ELECTROACOUSTIC TRANSDUCER ESPECIALLY ELECTROSTATIC SPEAKERS AND SYSTEMS
Lloyd J. Bobb, Glenside, Pa., assignor to Chester C. Pond, Doylestown, Pa.
Filed Oct. 9, 1970, Ser. No. 79,488
Int. Cl. H04r *19/02*
U.S. Cl. 179—111 R **3 Claims**



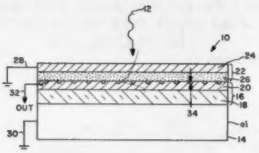
An electroacoustic transducer, especially an electrostatic speaker embodying a conductive perforated backing plate, a dielectric membrane carrying a conductive coating, and an intervening spacing layer formed of acoustically porous or transparent dielectric material having substantially uniformly and widely distributed local areas of contact with the membrane. A speaker frame is provided in which the perforated plate is mounted and the speaker preferably comprises a pair of membranes, spaced at opposite faces of the perforated plate, the membranes being adhesively secured to the frame. The membrane coating is also interrupted to provide electrically separated areas proportioned respectively to efficiently generate sound waves of different frequencies. A special form of speaker system is also provided incorporating both an electrostatic speaker and a dynamic speaker.

3,821,491

MICROPHONE CONSTRUCTION

Albert L. Whetstone, Southport, Conn.; Samuel Fine, New City, N.Y., and Robert Davis, Prospect, Conn., assignors to Amperex Electronic Corporation, Hicksville, Long Island, N.Y.

Filed May 15, 1972, Ser. No. 253,491
Int. Cl. H04r *19/00*
U.S. Cl. 179—111 E **4 Claims**



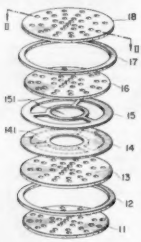
A novel construction method is provided for a linear extended capacitor electret foil construction microphone with a construction technique providing an infinite number of small capacitors in an equidistribution arrangement, for providing maximum sensitivity for given field strengths, and to provide an in situ method of microphone fabrication wherein the microphone is completely assembled and run through each heat cycling polarization to produce a finished thermo electret element.

3,821,492

ELECTRET TRANSDUCER HAVING TWO DIAPHRAGMS

Masahiko Tamura; Kiyonori Iwama, both of Tokorozawa; Akira Yamaguchi, Irima, all of Japan, and Mitsuo Asahina, deceased, late of Tokyo, Japan (by Toshiro Asahina, legal representative), assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 162,381, July 14, 1971, abandoned. This application June 26, 1973, Ser. No. 373,816
Claims priority application, Japan, July 14, 1970, 45-69759
Int. Cl. H04r *19/02*
U.S. Cl. 179—111 E **4 Claims**



An electrostatic electroacoustic transducer having two or more vibrating films. A treated signal is mechanically divided into two or more frequency ranges.

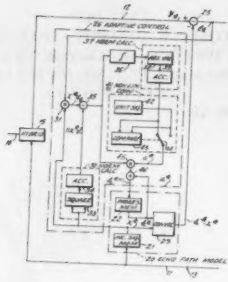
3,821,493

ADAPTIVE ECHO CANCELLER USING THE GRADIENT METHOD AND HAVING CORRELATOR MEANS

Seibi Chiba, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed May 8, 1972, Ser. No. 250,973
Claims priority, application Japan, May 15, 1971, 46-32651
Int. Cl. H04b *3/20*
U.S. Cl. 179—170.2 **6 Claims**

An adaptive echo canceller having an echo path model, means for subtracting the echo path model output from the output of the actual echo path, and means for adaptively controlling the echo path model in compliance with the amount of adjustment determined according to the gradient method,



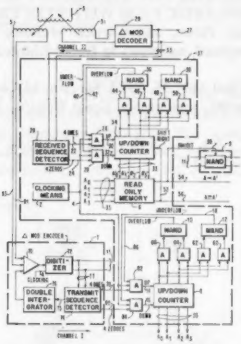
wherein the adaptive control means comprises correlator means for controlling the amount of adjustment in accordance with the measure of correlation between the input of the echo path model and the output of the subtracting means.

3,821,494

DIGITAL ECHO SUPPRESSOR WITH DIRECT TABLE LOOK-UP CONTROL BY DELTA CODED SIGNALS

Jacques A. Besseyre, Nice, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 14, 1972, Ser. No. 271,960
Int. Cl. H04b *3/20*
U.S. Cl. 179—170.6 **5 Claims**



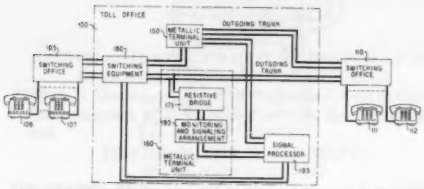
A digital echo suppressor in combination with a transmit channel and a receive channel, and in which sequences of digital delta coded signals in both channels are monitored and used to address a memory medium. In this context, each occurrence of a predetermined number of successive matched delta coded digits of either a first or second kind is used to correspondingly increment or decrement the memory address register. Relatedly, the contents of the memory locations constitute corresponding control signals for operating the transmit channel suppressor and for altering the receive channel gain.

3,821,495

SIGNAL LOOP TESTING APPARATUS

Thomas Guy Duff, New Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 26, 1972, Ser. No. 318,082
Int. Cl. H04b 3/46
U.S. Cl. 179—175 8 Claims



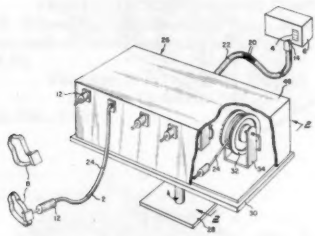
A circuit for simultaneously monitoring and signaling a plurality of signal loop conditions which utilizes a variable threshold voltage device to measure an electrical potential difference across a signal loop. The device develops output signals as a function of both threshold setting and measured potential difference. The output signals are indicative of polarity change (battery reversal), continuity failure, and other loop conditions.

3,821,496

ELECTRICAL CONDUCTOR ADJUSTING MEANS FOR MEDICAL DIAGNOSTIC EQUIPMENT

De Troy Malone, 508 Debra St., Carthage, Miss. 39051

Filed Mar. 9, 1972, Ser. No. 233,105
Int. Cl. H02g 11/00
U.S. Cl. 191—12.2 R 2 Claims



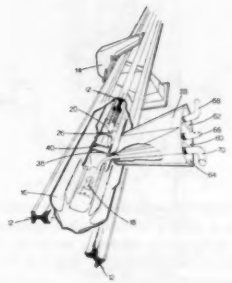
This invention relates to an apparatus for electrically connecting a plurality of remotely located sensor elements with corresponding input terminals of a centrally located electrical read-out means such as an electrocardiogram. More particularly, a plurality of conductors are adjustable in effective length to correspond generally with the spacing distances between the sensors and the electrical read-out means. Such adjustment is effected by a plurality of recoil reels mounted on a platform which is in turn rotatable about a fixed vertical axis. The platform may, therefor, be rotated to a preselected position to orient the conductors in a direction causing minimum entanglement of the conductors as each is displaced from a retracted to an extended position.

3,821,497

POLYPHASE COLLECTOR HEAD ASSEMBLY HAVING INNER PARTITION WALLS

Daniel Laurent, Grenoble, France, assignor to Societe Dauphinoise Electrique, Grenoble, France

Filed Mar. 14, 1973, Ser. No. 341,292
Claims priority, application France, Mar. 15, 1972, 72.9747
Int. Cl. B60l 5/36
U.S. Cl. 191—57 5 Claims



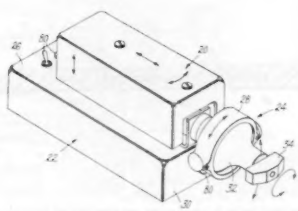
A polyphase collector head having a plurality of longitudinal rows of contact shoes resiliently biased into sliding contact engagement with a corresponding plurality of current distribution rails. The collector head is pivotally supported by a transverse support arm. The collector head and the support arm are hollow and comprise inner partition walls defining a plurality of compartments insulated from each other to accommodate electric connections to the contact shoes.

3,821,498

CONTROL PENDANTS

Hans F. Schaefer, Jr., Rockport, and David W. France, West Newbury, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed May 30, 1972, Ser. No. 257,836
Int. Cl. B25j 3/00, 13/02; H01h 21/12
U.S. Cl. 200—18 1 Claim



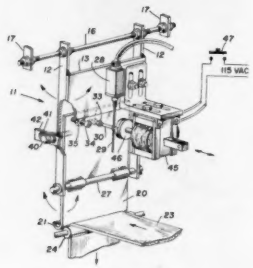
A control for a device having members movable along a plurality of axes has elements movable along axes corresponding to each axis of movement of the members of the device and means operatively connected to each control element for controlling means for moving members of the device along each corresponding axis of the device. The axes of movement are both linear and rotational.

3,821,499

ELECTROMAGNETICALLY RESETTABLE DEFECT DETECTING SENSOR MEANS FOR DEACTIVATING MECHANICALLY OPERABLE SENSOR SWITCH

Bernard D. Marsello, and Lindsey T. Matthews, both of Decatur, Ala., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 13, 1973, Ser. No. 331,730
Int. Cl. H01h *3/16*; B65h *25/14*
U.S. Cl. 200—61.13 6 Claims



An apparatus for detecting defects in a tow wherein a sensing portion of the apparatus in contact with the tow is movable by small imperfections in the tow to shut down the tow driving mechanism. The sensing element is mounted on a movable support member to allow additional movement of the sensing element when it is engaged by a knot in the tow. The sensing element is mounted in such a manner that a small amount of movement in that portion of the sensing element in contact with the tow results in a much larger movement of that portion of the sensing element which acts to shut down the drive mechanism.

3,821,500

FLOOR MAT WITH ELECTRICAL SWITCH

Barry G. Newman, Monsey, N.Y., assignor to Marc Manufacturing Inc., Stratford, Conn.

Filed Feb. 26, 1973, Ser. No. 335,807
Int. Cl. H01h *13/16*
U.S. Cl. 200—86 R 3 Claims

A floor mat which produces an electrical signal upon a force being applied, as by being stepped upon, by the force flexing a portion of a pair of spaced apart metal plates into engagement to complete a circuit and in which the plates are embedded within and adhered to a thick cured polyurethane covering material.

ERRATA

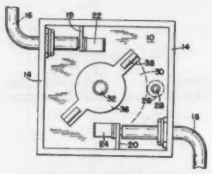
For Clases 200—153, 200—159, 200—249, 200—302, 200—330 and 200—338 see:
Patents Nos. 3,821,528 thru 3,821,534

3,821,501

BATTERY DISCONNECTOR

Robert W. Parmenter, 26 Burnett St., Auburn, Mass. 01501

Filed Jan. 12, 1973, Ser. No. 323,217
Int. Cl. H01h *19/20*
U.S. Cl. 200—155 R 1 Claim



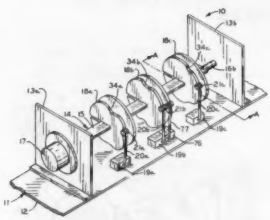
A battery disconnector particularly adapted for disconnecting the batteries of automobiles to prevent theft comprising a remote operated rotary switch having two fixed contacts, one to one of the cables of the battery, and the other preferably between the battery and the electric starting motor. A rotatable connector is adapted to carry the current between these contacts and is turned by a gear in turn operated by a pinion gear connected to a rotary shaft or the like which may be either locked by a key or have an operating handle hidden in an unexposed portion of the vehicle, e.g., under the dashboard.

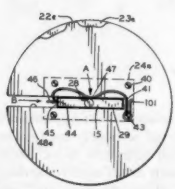
3,821,502

PROGRAM TIMER WITH ADJUSTABLE CAM HAVING SHAFT LOCKING AND REMOVAL MEANS

Stanley V. Joeckel, Wayne, N.J., assignor to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed May 11, 1973, Ser. No. 359,448
Int. Cl. H01h *43/10*; F16h *53/00*
U.S. Cl. 200—38 BA 16 Claims





A programable timer is provided which controls electrical or fluid switching devices. The timer is motor driven and is programmed by means of notches which are cut into the periphery of a plurality of disc type cams each having peripheral contouring. Each cam includes a radial slot for in-

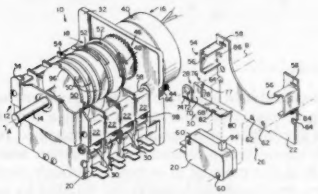
stallation on and removal from a flattened portion of the drive shaft. The flattened portion of the shaft and the sides of the slot cooperate to transfer rotation from the drive motor to the cam. Each cam includes a cam locking device to hold it on the shaft and the shaft includes notches to space and position the cams on the shaft. Thus the timer may be rapidly reprogrammed by sliding a cam radially from the drive shaft and replacing it with a cam having different notches on its periphery.

3,821,503

SWITCH ACTUATOR PIVOTAL MEANS FOR A CAM OPERATED TIMER SWITCH ASSEMBLY

William N. Homan, and Richard W. Stafford, both of Clayton, Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed July 30, 1973, Ser. No. 383,577
Int. Cl. H01h *43/10, 3/02*
U.S. Cl. 200—38 R **8 Claims**



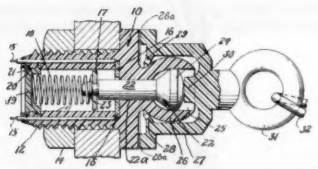
A timer switch capable of performing a timed-sequence electrical function includes a switch actuator pivotal support means that positions a switch actuator in spaced relation to a cam means and provides pivotal support for the switch actuator.

3,821,504

SAFETY SWITCH FOR SNOWMOBILES AND THE LIKE HAVING FLEXIBLE OPERATING PART DETACHABLE FROM SWITCH HOUSING BY CORD

Karl H. Schomaker, Horsham, and Henry E. Shontz, Pottstown, both of Pa., assignors to N.W. Controls, Inc., Vernfield, Pa.

Filed Apr. 5, 1971, Ser. No. 130,958
Int. Cl. H01h *17/08*
U.S. Cl. 200—52 R **8 Claims**



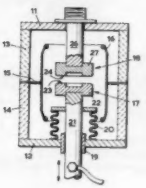
An interlocking safety device for use in the operating circuit of machinery such as a snowmobile or similar equipment. The device includes separable coupling members, one of which is a ball-shaped element and the other a socket-shaped element which must be interfitted for operation of the machinery. One of the coupling members is designed to be fastened to the operator of the equipment. Upon separation of the coupling elements the power source for the equipment is immediately stopped.

3,821,505

VACUUM TYPE ELECTRIC CIRCUIT INTERRUPTING DEVICES

Allan John Wood, Weeping Cross, England, assignor to The English Electric Company Limited, London, England

Filed May 17, 1973, Ser. No. 361,063
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B **7 Claims**



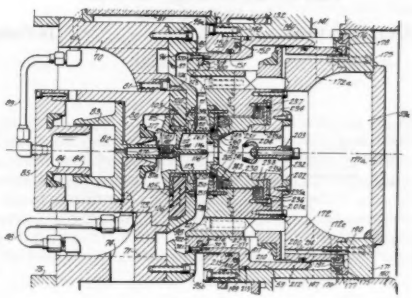
A vacuum interrupter having two contacts with co-operating contact-making parts each of which is constituted by a porous matrix of metal particles comprising chromium containing from 0.5 percent to 13.5 percent by weight carbon, or iron containing from 1.0 percent to 2.0 percent by weight carbon, metallurgically bonded together by compacting and heating under high vacuum, the interstices of the matrix being infiltrated under high vacuum with a metal which comprises copper or a copper alloy, and the infiltrated metal constituting between 10 percent and 40 percent of the volume of the infiltrated matrix. When the matrix metal is chromium the preferred range of the carbon content is 1 percent to 3 percent by weight of the matrix metal.

3,821,506

INFLATED VALVE SEAT FOR SYNCHRONOUS BREAKERS

Lorne D. McConnell, Chalfont, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Mar. 15, 1972, Ser. No. 234,893
Int. Cl. H01h *33/86*
U.S. Cl. 200—148 BV **15 Claims**

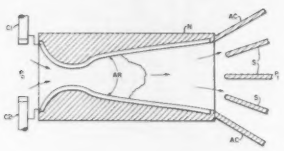


A synchronous circuit breaker has a movable interrupting contact which cooperates with a stationary interrupting contact, and also serves as a valve member which seals against an annular valve ring carried on the stationary support. The annular valve member is of a flexible material and is internally inflated to be pressed into full surface-to-surface engagement with the movable contact valve section. The valve is inflated by high-pressure gas used as an interrupting medium in the circuit interrupter and is disposed upstream of the interrupting contacts.

3,821,507
CIRCUIT INTERRUPTERS UTILIZING SUPERSONIC FLOW

Walter V. Bratkowski, McKeesport, and William H. Fischer, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 7,074, Jan. 30, 1970, abandoned.
This application Nov. 14, 1972, Ser. No. 306,509
Int. Cl. H01h *33/80*
U.S. Cl. 200—148 R 17 Claims

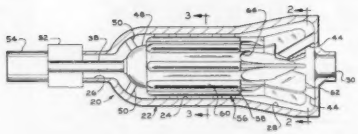


A circuit interrupter uses transonic or supersonic flow of an interrupting medium, such as air or other gas to interrupt direct or alternating currents. The interrupter is provided with a supersonic nozzle and an arc chute constructed to take advantage of high speed flow to remove ionized gases quickly and of directed expansion which stretches the arc core and length to interrupt the arc. The nozzle promotes supersonic flow of the interrupting medium into the arc path, and the arc chute provides smooth flow and continuous expansion of the arc gases, thereby increasing the interrupting ability of the breaker.

3,821,508
METHOD AND APPARATUS FOR HEATING FLUID

John P. Hagerty, Prescott, Ariz., assignor to Hagerty Research and Development Co., Inc., Prescott, Ariz.

Filed Apr. 23, 1973, Ser. No. 353,646
Int. Cl. H05b *5/08*
U.S. Cl. 219—10.49 18 Claims

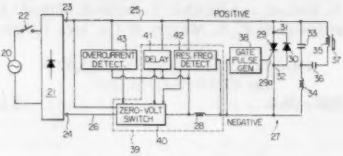


A first plurality or group of magnets is mounted in a housing in a pattern having a circular cross section. A second plurality or group of magnets is mounted in spaced relationship with respect to the first group and means are provided for moving one of the groups of magnets relative to the other. A conductive member is located in the space between the two groups of magnets, in the magnetic field therebetween. Rotation of the one group and variation in the flux causes the conductive member to become heated. A fluid is then directed past the member, in heat-transfer relationship with respect thereto, to cause the fluid to be heated and useable as a working fluid.

3,821,509
INDUCTION HEATING EQUIPMENT HAVING PROTECTIVE ARRANGEMENTS

Keizo Amagami; Hazime Mori; Takao Kobayashi; Mitsuyuki Kiuchi, and Yoshio Ogino, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Osaka, Japan

Filed July 24, 1972, Ser. No. 274,179
Claims priority, application Japan, Apr. 10, 1972, 47-36371; Apr. 10, 1972, 47-36372; Apr. 10, 1972, 47-36373; Apr. 10, 1972, 47-36364; Apr. 10, 1972, 47-36366
Int. Cl. H05b *5/04*
U.S. Cl. 219—10.77 7 Claims

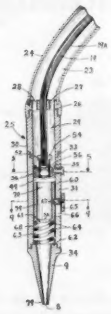


Herein disclosed is an induction heating equipment having a self-exciting chopper type inverter unit having a combination of a silicon controlled or otherwise gate-controlled rectifier and a diode connected in parallel to a d.c. power source for generating heat in a material to be heated through creation of eddy current and hysteresis losses in the material by building up a changing magnetic field induced by a current having suitable frequencies. Protective means are provided in such equipment so that the inverter unit, especially the silicon controlled rectifier of the unit, is protected from incurring a damage when the inverter unit is to be actuated or in the event an unusually increased voltage is produced in the inverter unit during operation. A typical application of the equipment is a cooking equipment using the induction heating process.

3,821,510
HAND-HELD LASER INSTRUMENTATION DEVICE

Hrand M. Muncheryan, 1735 Morningside St., Orange, Calif. 92667

Filed Feb. 22, 1973, Ser. No. 334,582
Int. Cl. B23k *27/00*
U.S. Cl. 219—121 L 28 Claims



This invention is a laser-beam transmitting and focusing device provided with means for selectively passing therethrough one or more fluids simultaneously for use during operation thereof in medical surgery, dental restorative manipulations, or materials working in industry. The invention

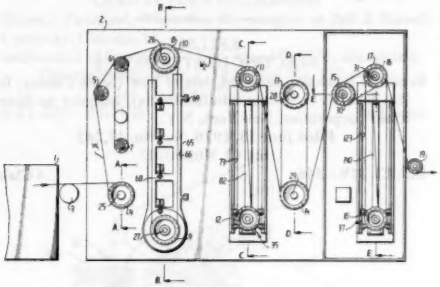
comprises a flexible laser-beam transmitting conduit having at one end thereof a hand-manipulative instrument or stylus containing an adjustable laser-focusing system and a fluid control means to regulate the flow of fluid therethrough during the operation of the device.

3,821,511

SOFTENING APPARATUS IN TANDEM ELECTRIC WIRE MANUFACTURE

Katsumi Sugano; Yoshio Ikegami, and Hirohumi Kimura, all of Kobe, Japan, assignors to Kobe Steel, Ltd., Kobe and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Mar. 7, 1973, Ser. No. 338,870
Claims priority, application Japan, Mar. 7, 1972, 47-23782
Int. Cl. C21d *9/62*
U.S. Cl. 219—155 **11 Claims**



A softening apparatus employed in the heat treatment step in a tandem electric wire manufacturing process wherein wire drawing, heat treating, extrusion coating, cooling and take-up steps are performed in tandem, for softening a core wire including a tension stabilizing mechanism for setting the tension of core wire in the heat treating step independently of the tension of the core wire in the subsequent steps being formed of a first dancer roller, a second dancer roller and a first capstan positioned between the first dancer roller and the second dancer roller, a softening mechanism for elevating the temperature of the core wire to its softening temperature being positioned in advance of the first dancer roller and a reheating mechanism for reheating the softened core wire being positioned between the first dancer roller and the first capstan.

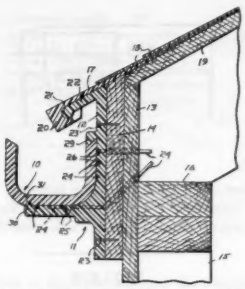
3,821,512

ELECTRICALLY HEATED GUTTERS AND DOWN SPOUTS

George H. Stanford, 191 Spurwink Rd., Scarborough, Maine 04074

Filed Sept. 28, 1972, Ser. No. 293,297
Int. Cl. H05b *1/00;* **E04d** *13/06*
U.S. Cl. 219—213 **11 Claims**

A water conductor includes a gutter and mounting means substantially coextensive in length. The mounting means has upper and lower portions attachable to the facia of a building with the lower portion having a support underlying the gutter. The support and the gutter have lengthwise complemental locking portions as do the gutter and the upper portion of the mounting means. Where gutter freezing is a problem, a heating element is positioned between the mounting means and the gutter.

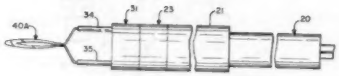


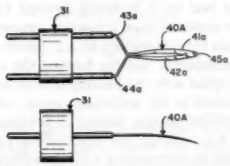
3,821,513

WAX CARVING TOOL TIP

Carl R. Christensen, 5412 Cottage Ave., San Diego, Calif. 92120

Filed Nov. 13, 1972, Ser. No. 305,701
Int. Cl. H05b *1/00;* **B23k** *3/00;* **A47l** *13/32*
U.S. Cl. 219—233 **2 Claims**





An electrically heated tool for forming and shaping wax-like substances is provided with a replaceable tool tip formed from electrical resistance wire. The wire of the tip is made into a narrow loop with a gap between the sides of the loop. The gap is closed at each end and provides a capillary tube action for applying or removing melted wax-like material. The resistance wire is flattened to a thin cross section in the plane of the sides of the loop and is curved along the longitudinal length thereof.

3,821,514

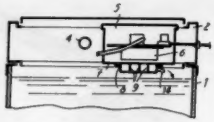
DEVICE FOR WARMING AQUARIUM WATER

Claude Lambo, Deurne, Belgium, assignor to APA Manufacturing N.V.

Filed Feb. 21, 1973, Ser. No. 334,359
Claims priority, application Belgium, Feb. 28, 1972, 51697; Feb. 13, 1973, 52520
Int. Cl. F24h *1/00*
U.S. Cl. 219—296 **4 Claims**

The aquarium comprises at least a filter, a gas discharge tube for lighting the aquarium, a load resistance for this tube,

a water tight and electrically insulated casing in which aforesaid load resistance is housed, whereby the outlet of



aforesaid filter is directed upon the housing, which is heated by the load resistance, for the purpose of heating this water which flows over it from aforesaid outlet into the aquarium.

3,821,515

APPARATUS FOR THE CONTROL OF ELECTRICAL HEATING

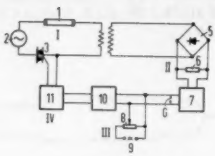
Hans Stut, Groebenzell, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 4, 1973, Ser. No. 321,034

Claims priority, application Germany, Jan. 17, 1972, 2201999

Int. Cl. H05b *1/02*

U.S. Cl. 219—497 **6 Claims**



Apparatus for controlling the electrical heating of a semiconductor rod as it is being formed by deposition of semiconductor material from a gaseous atmosphere includes a switching circuit for connecting an a.c. power source in series with the semiconductor rod for heating the same, a rectifier inductively coupled with the heating circuit for deriving a d.c. signal proportional to the arithmetic mean value heating current, and amplifier means having a feedback network for generating a d.c. voltage for controlling operation of the switching circuit in accordance with the effective value of the heating current. In another form of the apparatus, an amplifier having a feedback network has its input connected to an a.c. signal proportional to the heating current and generates a d.c. voltage which is a function of the effective heating current for controlling operation of the switching circuit.

3,821,516

METHOD AND APPARATUS FOR SENSING AND REGULATING THE TEMPERATURE OF A FLUID

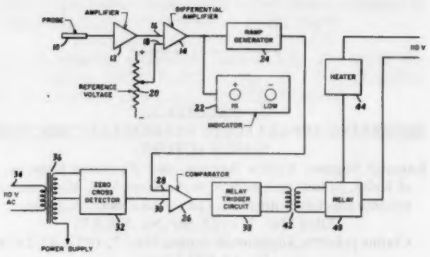
David F. Hayes, Henrietta, and Stanley M. Roth, East Meadow, both of N.Y., assignors to Laurel Color, Inc., West Hempstead, N.Y.

Filed Jan. 15, 1973, Ser. No. 323,736

Int. Cl. H05b *1/02*

U.S. Cl. 219—497 **21 Claims**

Method and apparatus for sensing and regulating the temperature of a fluid is provided having means for generating a first signal whenever the actual temperature of the fluid whose temperature is to be regulated is lower than a preselected temperature level. The first signal has an amplitude proportional to the magnitude of the difference between the actual fluid temperature and the preselected temperature level. Means are provided for generating an output signal whenever the amplitude of a reference signal exceeds the amplitude of the first



signal. Means are also provided for heating the fluid, the duration of said heating being proportional to the duration of said output signal.

3,821,517

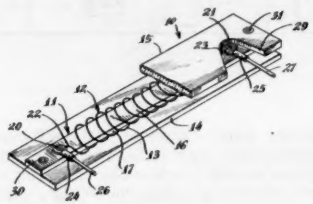
ELECTRIC HEATER DEVICE

Ernest S. Erickson, deceased, late of New Castle County, Del. (by Jane R. Erickson, administratrix), assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 18, 1970, Ser. No. 47,243

Int. Cl. H05b *3/02*

U.S. Cl. 219—546 **4 Claims**



An electric heater device comprising a heater coil helically wound around an elongated insulated support member and incuding tensioning means for stretching the coil longitudinally of the support member to space adjacent coil loops one from the other. A pair of insulated members are provided over the faces of the support member to electrically insulate the coil and to press the helically wound coil loops toward the support member.

3,821,518

POSITION AUTHENTICATION SYSTEM FOR INFORMATION-BEARING DEVICES

David M. Miller, 236 E. 36th St., New York, N.Y. 10016

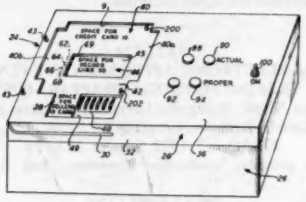
Filed Aug. 10, 1972, Ser. No. 279,711

Int. Cl. G06k *7/06, 19/06*

U.S. Cl. 235—61.11 **62 Claims**

A position authentication system for information-bearing devices, such as credit cards or the like, includes an information-bearing device having a plurality of authentication positions defined when the device is disposed in a predesignated reference position relative to a reader for reading said device. A plurality of authentication zones are defined on the device, one or more zones being associated with each distinct authentication position of the device and including means for defin-

ing a distinct readable code therein, such as a binary coded word. The reader reads the device in any of its authentication positions by reading the readable code defined in the predesignated authentication zone associated with the actual authentication position of the device.



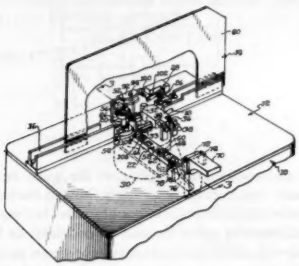
3,821,519
CARD RETURN MECHANISM

William J. Pietenpol, Winnetka, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 144,039, May 17, 1971, abandoned. This application Mar. 2, 1973, Ser. No. 337,446

Int. Cl. G06k *7/08, 13/20*

U.S. Cl. 235—61.11 D **16 Claims**



A card handling mechanism in a teaching machine for returning a magnetically striped information card to an initial position or to any selected position for replaying a word or group of words. The mechanism includes a first drive means for feeding the card in the forward direction, a second drive means for returning the card to the initial position or any desirable repeat position and a selectively operable control means for alternately engaging and disengaging the first and second drive means.

3,821,520
METHOD OF READING PUNCHED TAPE AND APPARATUS FOR SAME

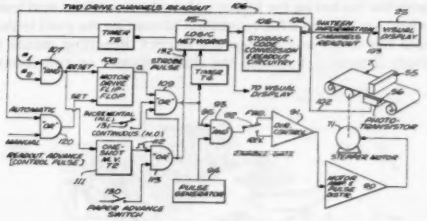
Duane A. Ladine, Glendale, Calif., assignor to Enviro-Labs, Inc., Glendale, Calif.

Filed Apr. 25, 1973, Ser. No. 354,229

Int. Cl. G06k *7/10;* **G08c** *9/06*

U.S. Cl. 235—61.11 E **19 Claims**

The method of reading a punched tape at a set of information hole locations that correspond to an alignment hole location, which consists in detecting the arrival at a reading station of the leading edge of the alignment hole, thereafter driving the tape forward a plurality of incremental distances each of which corresponds to a rather small fraction of the width of an information hole, and then reading the tape at the set of information hole locations. The method is also applied in conjunction with a tape having a pair of alignment hole channels by sensing the arrival at the reading station of the leading edge of the alignment hole in each channel and then reading the tape at a location determined in part as a function of any skewed relationship that may exist in the tape.



3,821,521
COMPUTING OR CALCULATING DEVICE

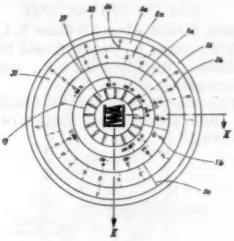
Harald Riehle, Esslingen am Neckar, Germany, assignor to IWA-Rechenschiebabrik F. Riehel KG, Esslingen, Germany

Filed Aug. 31, 1973, Ser. No. 376,835

Claims priority, application Germany, July 6, 1972, 2233134

Int. Cl. G06c *27/00, 3/00*

U.S. Cl. 235—119 **18 Claims**



Three concentric disks are supported on a base plate, rotatable with respect to each other. The center disk forms, additionally, the sun gear and the intermediate disk the planetary carrier of a planetary drive interconnecting the three disks, the top faces of which have scales engraved or printed thereon (for example logarithmic, so that the disks can function as a slide rule); the disks are covered by two relatively freely rotatable transparent cover plates having an index marking, and forming cursors. All scales are retained together by overlapping ridges, or notches, or the like. The backside of the bottom disk, or support plate, may likewise be formed with scales, and windows through which the scales therebeneath on the plates may be visible.

3,821,522
COUNTER

Cothburn M. O'Neal, Dallas, Tex., assignor to Riverside Press, Inc., Dallas, Tex.

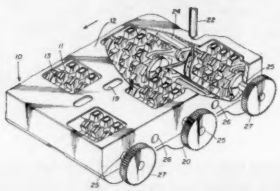
Filed Nov. 24, 1972, Ser. No. 309,193

Int. Cl. G06c *7/10*

U.S. Cl. 235—137 **17 Claims**

Mechanical counter units each having a plurality of indicator wheels arranged in successively higher order and commonly mounted on a shaft with other identical counter units are disclosed. A pawl actuator serves to advance the counter

are disclosed. A pawl actuator serves to advance the counter wheels through arms engageable with a ratchet on each counter. A keeper in the form of a notch carrying ring on the adjacent lower order wheel prevents engagement of the pawl with the ratchet on the higher order wheel until the next lower wheel has rotated a full revolution permitting the pawl to drop into the notch and engage the ratchet. Resetting means include a bushing keyed to the shaft adjacent an end counter



wheel. Transfer washers are disposed between the bushing and the counter wheels and between adjacent counter wheels and serve to interlock the wheels in a reset position when the shaft is rotated. In the preferred embodiment, the counters are arranged in a bank within a common housing which is engaged by a locking tray at the individual counter wheel to prevent inadvertent actuation. The entire counter bank assembly is moved away from the tray to unlock and actuate selected counters.

3,821,523

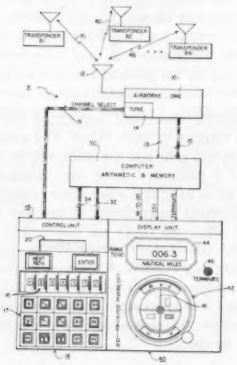
AIRCRAFT LOCATING SYSTEM USING AGILE TACAN/VORTAC/DME

John P. Chisholm, Boston, Mass.; William T. Lennon, Jr., Williamsville, N.Y.; James R. Doane, Grand Island, N.Y., and Frank Z. Maslow, West Seneca, N.Y., assignors to Sierra Research Corporation, Buffalo, N.Y.

Filed May 7, 1973, Ser. No. 358,074

Int. Cl. G06f *15/48*; G01s *5/14*

U.S. Cl. 235—150.27 **11 Claims**



A system for using ranges measured from aircraft to multiple ground stations of the TACAN, VORTAC, VOR/DME, or DME type wherein only the distance measuring features of the ground and airborne units are used to determine location of the aircraft to a high degree of accuracy far exceeding the normal capability of this type of equipment, the present system using an agile airborne DME unit which is switched in a rapid manner to interrogate said multiple ground stations successively and measure ranges thereto, the number of ground stations interrogated exceeding the minimum number required to provide a location, and a computer then processing this redundancy of range measurements by employing error factors for the measured ranges, which error factors are used in iterative computations to converge the apparent locations of the aircraft upon the actual locations.

3,821,524

DIGITAL ELECTRONIC APPROXIMATIVE FUNCTION TRACING METHOD AND APPARATUS

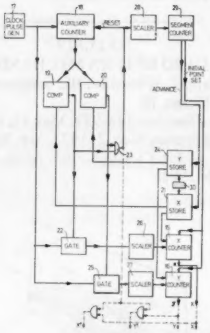
Karl-Heinz Wahl, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 7, 1972, Ser. No. 313,150

Claims priority, application Germany, Jan. 14, 1972, 2201690

Int. Cl. G06f *15/46*

U.S. Cl. 235—151 **11 Claims**



Stepping pulses advance a counter for each co-ordinate simultaneously, but in each case only so long as the output of a simultaneously stepped auxiliary counter does not equal or exceed the incremental value for that co-ordinate, as furnished by storage device, between two successive given points of the function. The counters may be started at the initial point of the function. When counting in all co-ordinates is complete, the auxiliary counter is reset.

Scaling circuits ahead of the counters reduce the number of counts to one out of n, while another scaling circuit with the same factor allows the auxiliary counter to be reset n times before the storage devices are advanced to provide information on the next linear segment of the given function. The result is a trace approximating the function which coincides with the line having two successive given points at $n-1$ evenly spaced intermediate points regardless of the slope of the line.

3,821,525

METHOD AND APPARATUS FOR AUTOMATICALLY COMPENSATED TUBE BENDING

Homer L. Eaton, Balboa, and Walter I. Shevell, Arcadia, both of Calif., assignors to Conrac Corporation, New York, N.Y.

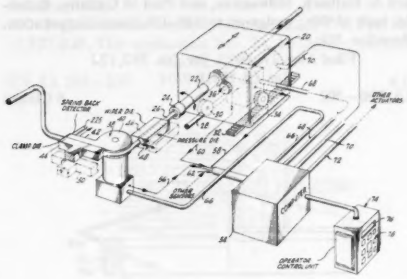
Filed Mar. 16, 1972, Ser. No. 235,283

Int. Cl. G06f *15/46*; B21d *7/14*

U.S. Cl. 235—151.1 **15 Claims**

Method and apparatus for automatically compensating specified tube bend data for angular, fixed and radial springback to generate commanded machine axis motions which will result in the specified bent tube. For a given tube material and bending machine configuration, a calibration run is performed with a test tube and, thereafter, for that material and machine configuration, a tube of any shape can be produced from the specified bend data alone. Bends of radius greater than the

machine bend die radius can be produced by automatically calculating and executing the axis commands for a series of incremental bends. The system incorporates a control sequence using operator response to machine generated questions and statements as well as general input and output capabilities.



3,821,526

TEXTILE MACHINES

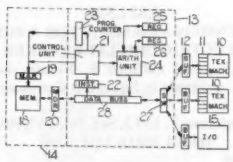
John Ernest Anderson, Wednesfield, England, assignor to Midland Industrial Computing Limited, Birmingham, England

Filed June 28, 1972, Ser. No. 267,254

Claims priority, application Great Britain, June 29, 1971, 30322/71; Oct. 20, 1971, 48758/71

Int. Cl. G06f *15/46*

U.S. Cl. 340–172.5 **83 Claims**



This invention concerns a stored program digital computer and a textile producing machine, the computer includes a fast random access store in which is stored information relating to the material to be produced by the machine and also a controlled program. The computer also includes a logic unit which receives signals from the machine and acts upon receipt of such a signal as instructed by the control program to supply fresh information for use by the machine. There is also provided a counter which can be set to count said signals, the counter being utilised in such a manner that when part or the whole of the infomation required to be supplied to the machine is unchanged, the computer does not supply the unchanged information for use by the machine.

3,821,527

METHOD AND APPARATUS FOR WALSH FUNCTION FILTERING

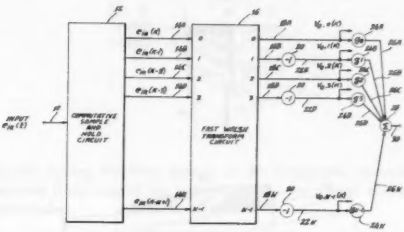
George S. Kang, Silver Spring, Md., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Oct. 4, 1971, Ser. No. 185,962

Int. Cl. G06f *15/34*

U.S. Cl. 235—152 **12 Claims**

A method and apparatus for generating running Walsh series expansion coefficients and for utilizing these coefficients to perform Walsh function filtering. An input signal is sampled, and the N most recent sampled values are commutatively stored. The stored sampled values are operated upon by a suitable means to generate N Walsh coefficients of the sampled input. Each of the generated Walsh coefficients is multiplied $(-1)^n$. The outputs from the multipliers are the N running Walsh coefficients for the received input. The weighted sum of the outputs from the multipliers may also be formed. By controlling the weighting values, digital filtering may be performed.



3,821,528

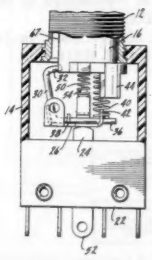
PUSHBUTTON SWITCH LATCHING MECHANISM

Peter J. Van Benschoten, Rancho Santa Fe, Calif., assignor to Oak Industries, Inc., Crystal Lake, Ill.

Filed Feb. 8, 1973, Ser. No. 330,574

Int. Cl. H01h *13/56*

U.S. Cl. 200—153 J **11 Claims**



An alternate action pushbutton switch includes a plunger which is movable between latch and release positions. The switch associated with the plunger is only operated when the plunger has been committed to a latch position.

3,821,529

MUSICAL INSTRUMENT PUSHBUTTON KEY OPERATED SWITCH WITH ADJUSTABLE PLUNGER KEY CAP

Richard G. Kallage, Jr., Evanston, and Robert C. Madland, Mount Prospect, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

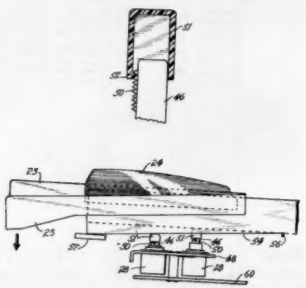
Filed Jan. 2, 1973, Ser. No. 320,632

Int. Cl. H01h *3/12*; **B41j** *5/16*

U.S. Cl. 200—159 R **1 Claim**

The embodiment of the invention disclosed herein is directed to a keyboard construction and electrical connection between a keyboard and its associated tone generators which electronically produce musical sounds. Each of the keys of the keyboard has associated therewith a switch structure which has a self-adjusting stem and stem cap which initially extends a distance greater than is ordinarily required during operation. When the keyboard is initially assembled, the first actuation of the key on the keyboard will depress the actuating stem and

cause the stem cap associated therewith to ratchet to a final position where it will always remain. Each of the switches on the keyboard is wired into a matrix which forms part of an encoder logic circuit located at the keyboard. A second similarly constructed decoder logic circuit is associated with the tone



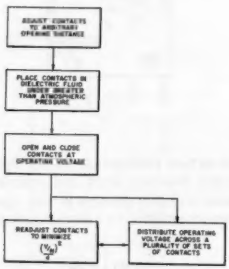
generators located within the cabinet of the musical instrument. Time-frame encoding exists between the two logic circuits so that the logic circuit within the organ cabinet knows exactly when one of the keys on the keyboard is depressed to thereby enable the associated tone generator. Only a few wires are needed to interconnect the two logic circuits.

3,821,530

METHOD OF REDUCING SOLID ARCING PRODUCT BUILD-UP BETWEEN ELECTRICAL CONTACTS IN PRESSURIZED FLUID AMBIENTS

Walter E. Pocock, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 20, 1972, Ser. No. 316,778
Int. Cl. H01h *1/34*
U.S. Cl. 200—249 **3 Claims**


ADJUST CONTACTS TO ARBITRARY OPENING DISTANCE
PLACE CONTACTS IN DIELECTRIC FLUID UNDER GREATER THAN ATMOSPHERIC PRESSURE
OPEN AND CLOSE CONTACTS AT OPERATING VOLTAGE
READJUST CONTACTS TO MINIMIZE
DISTRIBUTE OPERATING VOLTAGE ACROSS A PLURALITY OF SETS OF CONTACTS

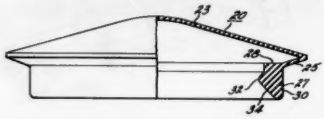
A method of substantially reducing the build-up of solid arcing products between contacts for making and breaking electrical circuits including the steps of adjusting the contacts to an arbitrary opening distance at which arcing will occur, placing the contacts in the dielectric fluid under greater than atmospheric pressure, opening and closing the contacts at a fixed operating circuit voltage to determine if the solid arcing product build-up forms, and readjusting the contact opening distance to minimize the value of the parameter $(V/N)^2/d$ where V is the operating circuit voltage, N is the number of sets of serially connected contacts and d is the distance between the contacts when in the fully open position. The value of the parameter may be further reduced by distributing V across a plurality of sets of such contacts connected in series and provided to be simultaneously actuated.

3,821,531

DUST SHIELD FOR PLUNGER OPERATED ELECTRICAL SWITCH

Edward A. Halbach, Milwaukee, and Paul M Gallatin, Brookfield, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 27, 1973, Ser. No. 392,124
Int. Cl. H01h *9/04*
U.S. Cl. 200—302 **6 Claims**



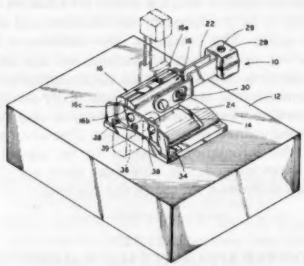
A plunger-operated electrical switch is provided with an annular retaining groove surrounding the plunger opening and a one-piece flexible dust shield of inverted-cup-shape disposed over the plunger and having a thin membrane cover portion integral with a radially inward extending annular lip that terminates in an annular retaining bead sealably wedged in the retaining groove. The membrane cover portion of the dust shield cooperates with the annular lip in the manner of a bellows to allow unrestricted plunger travel until it is nearly flush with the switch housing and with only minimal increase in switch height and with negligible increase in operating force.

3,821,532

HANDLE EXTENSION ASSEMBLY FOR A MOLDED CASE ELECTRIC CIRCUIT BREAKER

Donald Isaac, Jr., and Clifford F. Bishop, both of Cedar Rapids, Iowa, assignors to Square D Company, Park Ridge, Ill.

Filed June 7, 1973, Ser. No. 367,999
Int. Cl. H01h *3/02, 1/00*
U.S. Cl. 200—330 **2 Claims**

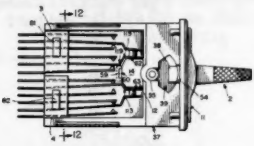


The handle extension assembly is readily mounted on the external portion of an operating handle of a molded case circuit breaker. It comprises a pair of mounting blocks fixedly mountable on opposite sides of the handle and a lever portion pivotally mounted on the mounting blocks so as to be movable from an inoperative position to an operative position where it facilitates manual movement of the handle.

3,821,533
ELECTRICAL SWITCH UNIT

James R. Bailey, Chicago, Ill., assignor to Switchcraft, Inc., Chicago, Ill.

Division of Ser. No. 200,761, Nov. 22, 1971, Pat. No. 3,727,020. This application Nov. 24, 1972, Ser. No. 308,962
Int. Cl. H01h 9/08
U.S. Cl. 200—338 4 Claims

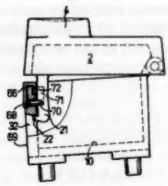


A lever-operated illuminated electrical switch unit is provided having front of panel mounting and removal, front of panel relamping, front of panel color changes and front of panel switch module changes. A novel lamp assembly and a novel actuator assembly are provided which can be removed simply by removing an escutcheon plate which snaps into place. Simplified means for mounting the switch unit from the front of a panel are also provided.

3,821,534
HINGED KEYBOARD SWITCH

Walter Mehner, Schwaig, and Werner Tietz, Renzenhof, both of Germany, assignors to DIEHL, Nurnberg, Germany

Filed Apr. 20, 1973, Ser. No. 353,092
Claims priority, application Germany, Apr. 22, 1972, 2219820
Int. Cl. H01h 3/04
U.S. Cl. 200—338 9 Claims



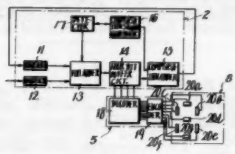
A keyboard switch having a housing for mounting on the conductor of a data processing device with a keyhead hinged to the housing. The housing and keyhead contain cooperating elements of circuit control means actuated by tilting of the keyhead on the housing. The hinge connecting the keyhead to the housing is constructed for assembly without tools. A latch device is provided which will latch the keyhead in depressed position on the housing when the keyhead is pressed downwardly and which will then release the keyhead upon again pressing downwardly on the keyhead.

3,821,535
ELECTRONIC CALCULATOR HAVING AN INDICATOR BLANKING CIRCUIT

Katsuhiko Nagakura, Atami, and Hidetoshi Kamoto, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 30, 1973, Ser. No. 328,031
Claims priority, application Japan, Jan. 31, 1972, 47-01165
Int. Cl. G06k 15/18
U.S. Cl. 235—156 8 Claims

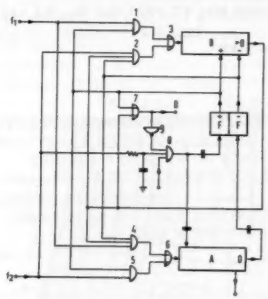
An electronic calculator of a type having a buffer circuit which is used both for an arithmetic operation and for a decoding operation in an indicator section, is provided with an indicator deactivating or blanking circuit for blanking the indicator during the time period of the arithmetic operation, whereby flickering of the indicator and consequent eyestrain are avoided.



3,821,536
METHOD OF DIGITALLY SQUARING THE RATIO OF TWO FREQUENCIES

Christoph Berg, Gottingen, Germany, assignor to Sartorius-Werke GmbH, Gottingen, Germany

Filed Sept. 13, 1972, Ser. No. 288,556
Claims priority, application Germany, Sept. 28, 1971, 2148323
Int. Cl. G06f 7/39
U.S. Cl. 235—160 10 Claims



This invention relates to a method of digitally squaring the ratio of two frequencies as for example in the measurement of weight by a chord balance. As distinct from prior art methods utilizing three counters the present invention utilizes only two counters and includes a flip-flop and a gate circuit for additive and subtractive counting.

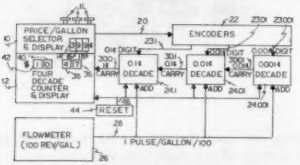
3,821,537
DISCOVERY IN A FLUIDIC COMPUTER

Robert F. O'Keefe, Trumbell, Conn., assignor to Automatic Switch Co., Florham Park, N.J.

Continuation of Ser. No. 44,782, June 9, 1970, abandoned. This application Mar. 28, 1972, Ser. No. 238,875
Int. Cl. G06d 1/10
U.S. Cl. 235—201 PF 20 Claims

A device for calculating and displaying the total gasoline sale price at a gasoline pumping station. A unit price selecting and displaying mechanism controls three fluidic encoders which translate the unit price of gasoline into binary-coded decimal numbers representing tenths, hundredths, and thousandths of a cent respectively. Fluidic decade circuits representing tenths, hundreds and thousandths of a cent respectively are arranged to receive these outputs from the encoders, so that the appropriate cost amounts are added in each decimal digit position. The addition is performed in response

to each one of a series of fluidic "add" pulses from a gasoline flowmeter. Each decade circuit includes a BCD adder receiving an addend input from its associated encoder, a BCD accumulator which receives the adder sum output, and a return path which reinserts the accumulator total as an augend input



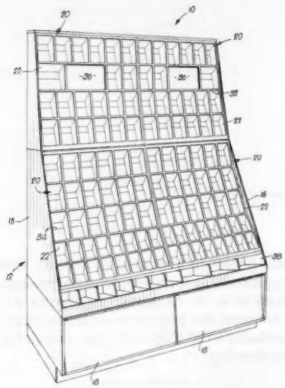
into the BCD adder. In response to the flowmeter pulses, the adder adds the unit price digit available from the encoder to the previous total available from the accumulator, and thus generates a new total for the accumulator. Each decade circuit develops a carry output to the next more significant decade.

3,821,538

ILLUMINATED PRODUCT DISPLAY FIXTURE FOR EDGE LIGHTING DISPLAYED ARTICLES

Isaac Jonathan, Kansas City, and John W. Madden, Overland Park, both of Kans., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.

Filed May 17, 1973, Ser. No. 361,142
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 AD **19 Claims**



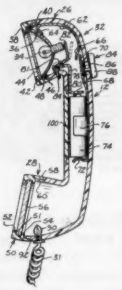
An illuminated product display fixture is provided having a plurality of upright, preformed, removable and interchangeable modules of translucent, synthetic resin material each presenting upright rows of article receiving pockets with combination light source and reflector means being strategically located behind the modules in disposition to effect edge lighting of products displayed in respective pockets. The back walls of the pockets are preferably covered with rearwardly facing reflector material to prevent passage of light therethrough and to augment diffusion of light rays from the source thereof so that customer observable hot spots are awarded. The modules are molded of a configuration such that the top walls of each pocket are of greater area than the bottom wall of the pocket there next above whereby the largest part of the light directed onto the article in each pocket is received from the translucent top wall thereabove for the most pleasing lighting effect without harsh glare.

3,821,539

SIMULATED TELEPHONE FLASHLIGHT

Joseph Kleinman, 8504 16th St., Silver Spring, Md. 20910

Filed Mar. 2, 1973, Ser. No. 337,672
Int. Cl. A45c *15/06*
U.S. Cl. 240—6.45 R **9 Claims**



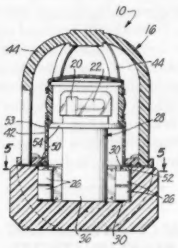
A flashlight in the form of a simulated telephone handset. A lamp bulb and reflector are mounted in the earpiece and a mirror is mounted in the mouthpiece, or vice versa. The mirror and lamp are at an angle to each other such that the axis of the beam of light emanating from the earpiece intersects the axis of the mirror at a finite location from the handset. This relationship permits the use of the flashlight as a mirror with an illuminated field of view for applying cosmetics. The handset has a coiled cord and a receiver to which the cord is connected. In one embodiment a battery is mounted within the handgrip portion of the handset and the cord is removable to permit use of the flashlight outside the automobile. In another embodiment the cord contains wires and terminates at a plug adapted to be plugged into the cigarrette lighter socket of an automobile. A simulated telephone receiver adapted to be mounted on the dashboard of an automobile has a hanger to hang the handset when not in use as a flashlight. The handset can have a safety switch which overrides a manual switch and deenergizes the lamp bulb automatically when the handset is placed on its hanger.

3,821,540

LANTERN

Robert H. Watt, 925 Springfield, Apt. A, Upland, Calif. 91786

Filed Sept. 29, 1972, Ser. No. 293,678
Int. Cl. F21v *33/00*
U.S. Cl. 240—6.4 R **7 Claims**



A gravity actuated, battery powered lantern having a gravity operated switch which closes to turn on the lantern when it is rotated to an upright operating position and opens to turn off the lantern when it is rotated to an inverted storage position. The lantern is self righting to its operating position and has an impact resistant water tight construction and may emit either

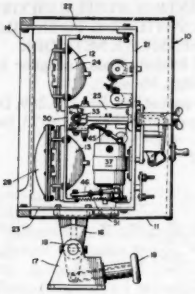
a flashing light or a constant light. The lantern may be used for a variety of purposes including a highway, marine, aircraft or railroad marker or emergency warning light that may be dropped from a moving vehicle or, if desired, a portable lamp, and so on.

3,821,541

FLASHING SIGNAL LIGHT

Oliver J. Burland, 214 Rugby Rd., Western Springs, Ill. 60558

Filed Jan. 24, 1973, Ser. No. 326,433
Int. Cl. F21l *15/02*; **F21q**
U.S. Cl. 240—22 **10 Claims**



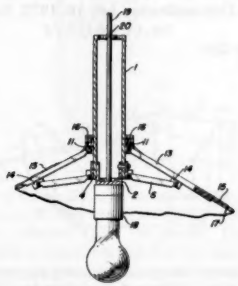
A flashing signal light includes a pair of generally vertically spaced lamps mounted on a lamp frame which is pivotable about vertical and horizontal axes. A motor within the casing includes a pair of drive shafts, and a link connects each drive shaft to the frame for pivoting the frame about one of the axes. The frame pivots faster about the horizontal axis than the vertical axis, and a pair of springs extend from the lamp frame on opposite sides of the horizontal axis to the casing for cushioning shocks and vibration in the drive train for pivoting the frame about the horizontal axis as the drive link reaches the end of each reciprocation.

3,821,542

COLLAPSIBLE TYPE LIGHTING FIXTURE

Masaharu Kitamura, Babaminamimachi; Kiyohiko Murakami, Mukoumachi, and Hiromu Watanabe, Amagun, all of Japan, assignors to Kuroi Electric Industrial Company, Kyoto, Japan

Filed July 20, 1972, Ser. No. 273,618
Claims priority, application Japan, July 24, 1971, 46-55315; July 24, 1971, 46-65605
Int. Cl. F21v *17/00*
U.S. Cl. 240—145 **4 Claims**



A device consisting of a lamp fixture which may be collapsed in a manner similar to an umbrella during shipment and easily reassembled by reversing the collapsing process. The shade ribs of the lamp move along the main body of the lamp to achieve the collapsed position. In one embodiment the main body portion has a cavity for enclosing at least a portion of the shade covering when the lamp is collapsed.

3,821,543

APPARATUS FOR HANDLING LINEAR ELEMENTS

Robert J. Gelin, Newark, Ohio, and James E. Sanders, Jackson, Tenn., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 27, 1973, Ser. No. 336,315
Int. Cl. B65h *54/02*, *57/04*, *57/16*
U.S. Cl. 242—42 **18 Claims**

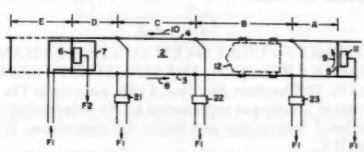
Apparatus for processing a plurality of glass strands into a wound package in a glass filament forming operation. The apparatus includes two strand guide members that have notches communicating with strand guide spaces defined by converging guide surfaces each forming an angle greater than 180 degrees and substantially smaller than 270 degrees. The converging guide surfaces are oriented to facilitate movement into the notch of a strand or filament introduced into the guide space.

3,821,544

APPARATUS FOR SENSING POSITIONS OF VEHICLE ALONG A TRACK USING VOLTAGE SENSING IN CURRENT TRACK CIRCUITS

Thomas C. Matty, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 24, 1972, Ser. No. 274,696
Int. Cl. B61l *21/00*
U.S. Cl. 246—34 CT **4 Claims**



A vehicle control system in which a vehicle is operative on steel rails and in which a plurality of conductors are connected between the rails at predetermined locations. A track section between and including two such conductors forms a track circuit signalling block. At one end of the signalling block track current is introduced into the rails and a receiving antenna is positioned adjacent the conductor forming the other end of the track circuit signalling block. In the absence of a vehicle within the block, the receiving antenna senses a track current at a relatively high level and when a vehicle enters the track circuit signalling block the receiving means senses track current at a substantially reduced level. A plurality of voltage sensing means are located at predetermined locations across the track circuit signalling block for sensing the position of the vehicle within the signalling block. Each such voltage sensing means senses a voltage signal at a predetermined level in the absence of the vehicle being present adjacent the voltage

sensing means. When the vehicle reaches a given voltage sensing means, the given voltage sensing means then senses voltage at a greatly reduced signal level which is indicative of the vehicle being present. Signal responsive means respond to the latter signal to provide an indication of vehicle presence at the given location.

3,821,545

MASK ALIGNMENT IN MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUITS

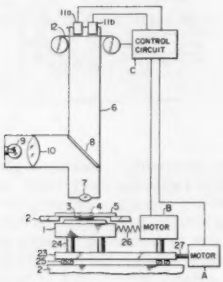
Yasuo Nakagawa, and Nobuyuki Akiyama, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1973, Ser. No. 362,733

Claims priority, application Japan, May 26, 1972, 47-51662; June 2, 1972, 47-54338

Int. Cl. G01j *1/20, 1/36*

U.S. Cl. 250—201 **17 Claims**



A mask for manufacture of semiconductor integrated circuits provided with a position detecting pattern for alignment of the mask with a semiconductor wafer also provided with a counterpart position detecting pattern and an arrangement for the alignment capable of both coarse alignment and fine alignment. The position detecting pattern of the mask consists of a plurality of windows arranged outwardly from the center of the pattern. The coarse alignment is performed by detecting the light reflected by the detecting pattern of the semiconductor wafer through the outermost windows of the detecting pattern of the mask, while the fine alignment is performed by detecting the reflected light through all of the windows of the pattern of the mask.

3,821,546

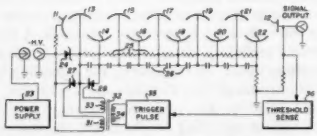
PHOTOMULTIPLIER CIRCUIT INCLUDING MEANS FOR RAPIDLY REDUCING THE SENSITIVITY THEREOF

James O. McClenahan, San Jose, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 28, 1972, Ser. No. 310,193

Int. Cl. H01j *39/12*

U.S. Cl. 250—207 **1 Claim**



A photomultiplier tube comprising a plurality of electrodes including a light sensitive cathode, an anode, and a plurality of dynodes positioned in space-apart manner along the electron beam path between the cathode and anode and having a power supply and a voltage divider for supplying bias voltages across each successive pair of electrodes along the beam path, at least one switching device being provided across a pair of said electrodes, preferably across the cathode and first dynode or across the first and second dynodes, which, when activated, will rapidly reduce the bias voltage across the associated pair of electrodes to near zero, thereby substantially reducing the sensitivity of the multiplier to protect it from the effects of excessive light intensity input. In a preferred embodiment of the invention, an SCR is coupled across the cathode and first dynode and is operated by a blanking or trigger pulse applied to its control gate to rapidly reduce the bias voltage across this first stage. Additional switching rectifiers may be employed across other stages of the multiplier to insure the desired reduction in sensitivity.

3,821,547

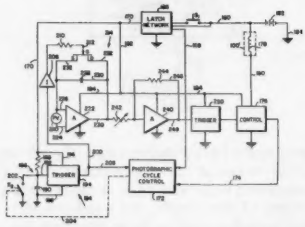
EXPOSURE CONTROL SYSTEM INCORPORATING SOLID STATE SWITCHING TO ENABLE A LIGHT SENSITIVE NETWORK

Edwin K. Shenk, Littleton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 213,289, Dec. 29, 1971, abandoned. This application Feb. 21, 1973, Ser. No. 334,216

Int. Cl. H01j *39/12*

U.S. Cl. 250—214 P **10 Claims**



An exposure control system for photographic cameras of a variety which perform a number of operational events in the course of a photographic cycle. Among these events is a reflex conversion from a viewing-focusing operational mode to exposure operational mode and subsequent return to the said viewing-focusing mode. Gateable electronic switching means are utilized to retain the light detecting network of a light sensitive circuit in a pre-exposure initial condition prior to the commencement of the noted exposure mode. Preferably, the switching function is present in the form of a field effect transistor.

3,821,548

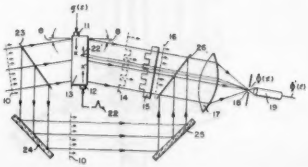
INVERTED TIME IMPULSED BRAGG ANGLE MATCHED FILTER

James L. Jernigan, Inyokern, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 763,054, Sept. 25, 1968, abandoned. This application July 10, 1972, Ser. No. 270,366

Int. Cl. H01j *3/14*

U.S. Cl. 250—216 **11 Claims**



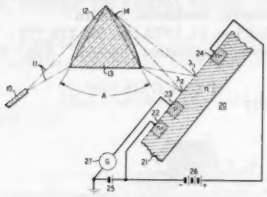
A means for encoding and decoding electrical signals using monochromatic spatially coherent light by impulsing a Bragg Angle matched filter in such a manner that the output light beam and electrical signals will be in the correct order for correlation.

3,821,549

SEMICONDUCTOR DRIFT PHOTODETECTOR FOR EQUALIZATION OF OPTICAL FIBER MATERIAL DISPERSION

Detlef Christoph Gloge, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 18, 1973, Ser. No. 398,420
Int. Cl. G01j 3/34; G02b 5/14
U.S. Cl. 250—211 J 10 Claims



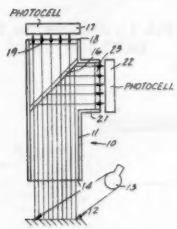
An optical signal having a non-negligible bandwidth suffers a distortion while propagating in an optical fiber caused by the fact that signal components of different optical wavelengths propagate at different velocities through the fiber material, that is, by the dependence of refractive index upon wavelength (material dispersion). In order to compensate for this distortion, an optical prism (or diffraction grating) is located in the path of the output wave exiting from the fiber, which angularly separates the various output wavelengths. The angularly separated output waves are then incident upon a semiconductor P-N junction detector of the charge carrier drift type, such that the time delays of different wavelengths in the fiber are compensated by the different drift time delays of the different charge carriers generated by the different wavelengths absorbed in the drift region of the semiconductor.

3,821,550

PLANT THINNER HAVING RADIANT ENERGY PLANT DETECTING MEANS

Melvin E. Priest, Caldwell, Idaho, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 843,122, July 18, 1969, abandoned.
This application Sept. 22, 1972, Ser. No. 291,419
Int. Cl. G01j 3/34
U.S. Cl. 250—226 6 Claims



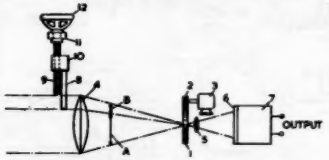
A plant sensing device for operating a mechanical hoe and including apparatus such as a light source for detecting plants through energy reflected from the plants. The energy is separated into two components and the two components are compared. When a plant is adjacent the detector, the two components will have relatively large difference and when a plant is not present the components will be substantially the same. When the former occurs it creates a signal which operates the mechanical hoe.

3,821,551

RADIATION DETECTION SYSTEM COMPRISING TWO SETS OF FILTERS FOR EFFECTIVE CHOPPING

Sydney Jones, Malvern, England, assignor to The Minister of Supply in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 12, 1954, Ser. No. 415,833
Claims priority, application Great Britain, Mar. 14, 1953, 7,129/53
Int. Cl. G01d 5/36
U.S. Cl. 250—233 9 Claims



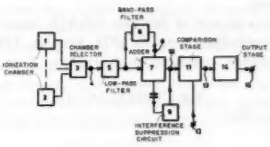
A radiation detector device utilizing chopper techniques to distinguish between background and target signals. Choppers comprising two sets of filters are used, with the spectral transmission properties so determined that unwanted radiation is unchopped.

3,821,552

CIRCUIT ARRANGEMENT IN PARTICULAR FOR X-RAY DIAGNOSTIC APPARATUS

Bernd Hermeyer, Henstedt-Ulzburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1972, Ser. No. 303,247
Claims priority, application Germany, Nov. 3, 1971, 2154539
Int. Cl. G01t 1/18
U.S. Cl. 250—388 9 Claims



In an electronic exposure meter for an X-ray diagnostic apparatus use is made of a circuit arrangement comprising digital circuit components. This results in a higher exposure accuracy and avoids incorrect switching as well as the use of inductances and capacitances which are difficult to maintain in practice. An active filter circuit is used as an input band-rejection filter, the said circuit consisting of a band-pass filter and an adding stage which provides automatic offset correction and delay-correction. The adding stage is followed by an interference suppression device and a positively fed back field effect transistor differentiating stage.

3,821,553

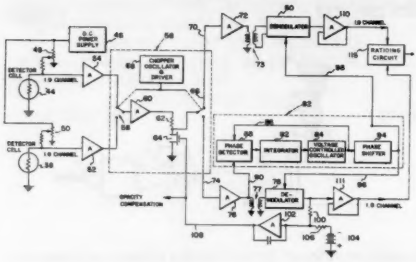
DUAL WAVELENGTH MOISTURE GAUGE HAVING AUTOMATIC GAIN CONTROL

John Michael French, San Jose, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Nov. 17, 1972, Ser. No. 307,332
Int. Cl. G01t 1/00
U.S. Cl. 250—339 5 Claims

A dual wavelength type moisture gauge having a fixed source of radiation and capable of measuring moisture on all

grades of paper. A fixed source of radiation having at least two wavelengths, one of which is sensitive to absorbtion of water and another which is substantially less sensitive to absorbtion by water, is positioned on one side of a sheet of paper. A detector unit is positioned either to receive backscattered radiation or transmitted radiation. The detector unit includes optical filters for separating the two wavelengths of interest. Transducers convert the optical signals to corresponding electrical signals. Connected to the transducers is an automatic gain control amplifier that has an input portion which alternately samples the two signals. The samples are amplified and supplied to an output portion which is synchronized with the input sampling portion for separating the sampled and amplified signals. One of the output signals is fed back to the gain control of the amplifier such that the gain of the amplifier will vary inversely with the output of the amplifier.



3,821,554

MAGNETIC LENS ASSEMBLIES FOR CORPUSCULAR RAY SUPERCONDUCTIVE DEVICES WHICH OPERATE UNDER VACUUM

Helmut Zerbst; Reinhard Weyl, and Isolde Dietrich, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

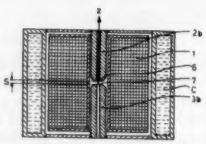
Continuation-in-part of Ser. No. 648,623, June 26, 1967.

This application June 30, 1971, Ser. No. 158,373

Claims priority, application Germany, Sept. 21, 1966, 105,968

Int. Cl. H01j *37/10*

U.S. Cl. 250—396 **14 Claims**



A magnetic lens assembly for a corpuscular ray device such as an electron microscope, ion microscope, electron-diffraction device or other corpuscular ray apparatus comprises a pair of shielding cylinders of superconductive material which are coaxially spaced from each other and which have their common axis coinciding with the lens axis. The shielding cylinders are surrounded by a lens winding which may also be made of superconductive material. The magnetic field produced by the winding is concentrated by the shielding cylinders in the region of the corpuscular ray. The shielding cylinders have directed toward each other a pair of end faces which are spaced from each other and define between each other a lens gap devoid of any shielding components made of superconductive material. The aperture error constant of the lens assembly depends upon the maximum value of the field intensity in the lens gap and upon the field gradient along the lens axis in the lens gap. The magnitude of the lens gap is chosen in such a way that for a fixed value lens-winding excitation, the maximum value of field intensity in the lens gap and the field gradient in the lens gap along the lens axis are optimized to produce a minimum of the aperture error constant.

3,821,555

APPARATUS FOR ALTERNATELY IRRADIATING AN OBJECT BY MEANS OF AT LEAST TWO RADIATION SOURCES

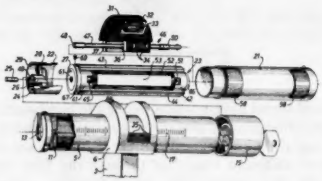
Gosta Ambjorn Mattsson, Trosa, Sweden, assignor to Aktienbolaget Atomenergi, Stockholm, Sweden

Filed Aug. 11, 1972, Ser. No. 279,777

Claims priority, application Sweden, Aug. 13, 1971, 10364/71

Int. Cl. G21h *5/00*

U.S. Cl. 250—497 **17 Claims**



This application discloses an apparatus for alternately irradiating an object by means of a radioactive source and at least one further radiation source. The sources are mounted in a holder pivotably arranged within a tubular housing being longitudinally diplaceable in a bracket and having a collimator opening, a selected source being brought into radiation position aligned with said collimator opening by turning said holder. The holder is turned by means of a longitudinal armature or permanent magnet system coupled to said holder in said housing and being pivotable around a longitudinal axis due to magnetic action at any portion of its length, said magnetic action being provided by an electromagnet arranged in connection with said bracket.

3,821,556

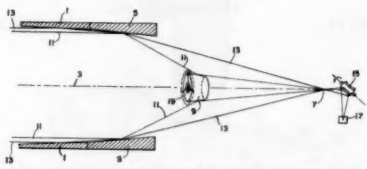
THREE MIRROR GLANCING INCIDENCE SYSTEM FOR X-RAY TELESCOPE

Richard B. Hoover, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 15, 1972, Ser. No. 226,477

Int. Cl. H01j *37/26*

U.S. Cl. 250—505 **3 Claims**



An X-ray telescope suitable for soft X-ray astronomical observations comprising a paraboloid section for receiving rays at a grazing angle followed immediately by a hyperboloid section which receives reflections from the paraboloid at a grazing angle and directs them to a predetermined point of focus. A second hyperboloid section is situated centrally spaced

from the other two surfaces and positioned to reflect from its outer surface to the predetermined point of focus radiation from the hyperboloid which is not first reflected by the paraboloid. A shutter is included in the system to assist in calibration.

3,821,557

DEVICE FOR CHECKING MOVABLE WEBS OF PAPER, SYNTHETIC MATERIAL, METAL FOILS, AND THE LIKE

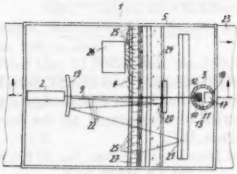
Paul Lipke, deceased, late of Walther-Rathenau-Str. 14, 5450 Neuwied, Germany (by Rudolph Hiemke, testamentary executor)

Filed Mar. 12, 1973, Ser. No. 340,001

Claims priority, application Germany, Mar. 10, 1972, 2211654

Int. Cl. G01n *21/18, 21/30*

U.S. Cl. 250—572 **13 Claims**



A device for checking a moving web in which a small beam of radiation is generated which is deflected by deflecting means which includes a small light-weight oscillating element so as to scan the moving web from side to side while radiation sensitive means is provided to intercept the beam as it leaves the web.

3,821,558

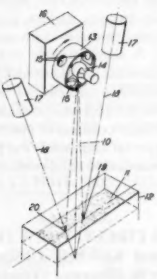
DETERMINATION OR MONITORING OF THE DISTANCES OF SURFACES FROM REFERENCE POSITIONS

John William Brian Mansfield, London, England, assignor to Fleet Electronics Limited, London, England

Filed Aug. 9, 1972, Ser. No. 279,233

Int. Cl. G01f *23/28;* **G01b** *11/22;* **G01n** *21/26*

U.S. Cl. 250—577 **10 Claims**



In an apparatus for monitoring the height to which material has been filled into commodity packages, the level of the top surface of the material in each package is determined, without physical contact between the apparatus and the material, by traversing a light beam across said top surface and generating a signal when the spot of light on said top surface intersects the viewing beam or beams of one or more photoelectric detector cells. The light beam and the viewing beam lie in a common plane but have different angular directions, at least at the instant of intersection. The point in the light beam traverse cycle at which intersection with the viewing beam takes place therefore varies in time according to the level of the top surface of the material in the package and so gives a measure of that level.

3,821,559

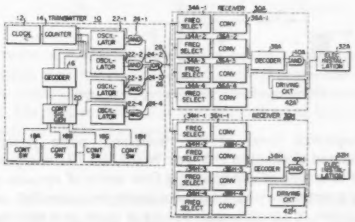
CONTROL SYSTEM FOR ELECTRIC INSTALLATIONS

Atsushi Ueda, and Mitsuaki Ishii, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 2, 1973, Ser. No. 320,628

Int. Cl. H02g *3/00*

U.S. Cl. 307—10 R **10 Claims**



In the disclosed system a 3-bit binary coded signal having eight words each corresponding to one of eight switches and control signals corresponding to those switches in their "ON" and developed in response to the binary coded signals are represented by amplitude varying currents wherein different frequencies correspond to different bits of the binary coded signal. The binary coded signals and the control signals are delivered via a single transmission line to eight receivers connected to respective electric devices. In each receiver the signals are restored to their original forms and a binary coded signal corresponding to an associated switch is decoded and applied along with the control signal resulting from that switch, being closed, to a driving circuit for enabling an associated electric device. Only those binary coded signals assigned to closed switches are delivered to the receivers.

3,821,560

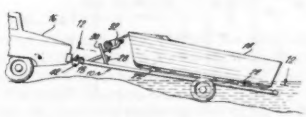
LIGHTING FIXTURES FOR BOAT TRAILERS

Norman Joseph Hansen, 4055 Beechwood Ln., Mobile, Ala. 36609

Filed Feb. 5, 1973, Ser. No. 329,675

Int. Cl. H02g *3/00*

U.S. Cl. 307—10 LS **4 Claims**

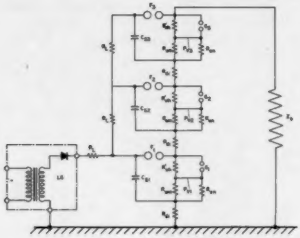


A toggle switch arrangement is mounted on a boat trailer frame intermediate the trailer tail lights and the towing vehicle. This allows disconnection of electric current to the trailer before a boat launching or loading operation during which the back of the trailer may become immersed in water.

3,821,561
MULTISTAGE PULSE GENERATOR

Kurt Feser, Therwil, Switzerland, assignor to Emil Haefely & Cie. AG, Basle, Switzerland

Filed June 4, 1973, Ser. No. 366,859
Claims priority, application Switzerland, June 5, 1972, 8294/72
Int. Cl. H02m *3/18*
U.S. Cl. 307—110 **1 Claim**

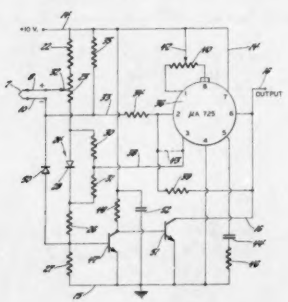


An improved form of the multistage pulse generator described and claimed in U.S. Pat. No. 3,504,191 comprises a plurality of stages of capacitors, a first series of circuits each having a resistor for charging the capacitors in parallel, and a second series of circuits each having a spark gap therein for discharging the capacitors. The discharge circuit of each of the aforesaid second circuits has two parallel branches, the first of which is a high value resistance branch improved to include two series-connected resistance elements, and the second of which includes a series combination of a low value resistor and an auxiliary discharge device, the improvement being a low resistance voltage connection provided between the junction point of the two series-connected resistance elements of the first branch and the junction point between the low value resistor and the auxiliary discharge device of the second branch.

3,821,562
THERMOCOUPLE AMPLIFIER

James L. Davis; Edward L. Lopke, both of Kokomo, and Leslie J. Pechous, Carmel, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed July 20, 1973, Ser. No. 381,055
Int. Cl. H01h *35/00*
U.S. Cl. 307—117 **6 Claims**

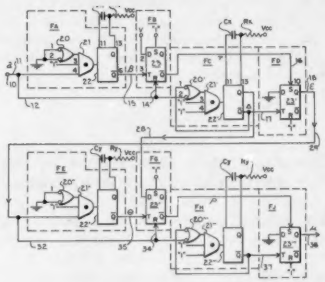


A thermocouple system includes an operational amplifier connecting a thermocouple to an output line with arrangements to provide an abnormally low output when there is a ground or short in the thermocouple or its leads. The positive thermocouple lead is connected to a point between a controlled voltage positive supply and ground of a voltage divider network including a cold junction compensator. The negative lead of the thermocouple is connected to the controlled positive line through a resistor and to the normal inverting input of the operational amplifier. If the thermocouple circuit opens, the normal drop through the voltage divider is lost and the amplifier input goes to a high voltage level and the output to a low level. The operational amplifier output may be overridden by a switching transistor which is normally held turned off by a normally conducting first stage transistor. The first stage transistor is of the NPN type with emitter grounded and collector connected through a resistor to the positive supply. The base of this transistor is connected to a point in the thermocouple voltage divider circuit between the thermocouple and ground so that grounding of the positive thermocouple lead turns it off. The base of this transistor is also connected through a diode to the negative thermocouple lead, the diode having a lower voltage drop than the base-emitter circuit of the transistor, so that grounding the negative thermocouple lead also turns it off.

3,821,563
ASYNCHRONOUS BAND-PASS PULSE WIDTH FILTER

Samuel C. Warren, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 18, 1973, Ser. No. 371,030
Int. Cl. H03k *5/18*
U.S. Cl. 307—234 **5 Claims**



A band-pass pulse width filter for filtering a sequence of positive going digital pulses. A first pulse width filter having four two-stage logic circuits blocks pulses having a width lesser than a first predetermined width and provides an output for all other pulses. A second pulse width filter having four two-stage logic circuits has an input coupled to the output of said first pulse width filter and blocks pulses having a width greater than a second predetermined width. The output of the second pulse width filter consists of positive going digital pulses having a width greater than said first predetermined width and a width lesser than said second predetermined width.

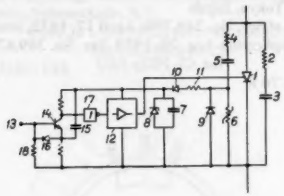
3,821,564
CONTROL CIRCUIT FOR A THYRISTOR

Georg Lindblom, and Karl-Erik Olsson, both of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Jan. 29, 1973, Ser. No. 327,437
Claims priority, application Sweden, Feb. 1, 1972, 1103/72
Int. Cl. H03k *17/16, 17/56*
U.S. Cl. 307—252 H **6 Claims**

A control circuit for a thyristor includes a voltage divider connected in parallel with the thyristor for feeding the control circuit. The voltage divider includes a resistor nearest the anode of the thyristor and in series with the resistor a parallel connection of a capacitor, a Zener-diode and a varistor. The feeding circuit of the control circuit is connected over such

parallel connection. The resistor is dimensioned with regard to the desired current in the voltage divider, while the parallel

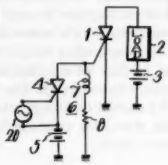


connection is dimensioned to store in the condensor the necessary feeding voltage over the control circuit.

3,821,565
SWITCHING CIRCUIT UTILIZING GATE-CONTROLLED SWITCHING DEVICE

Hiroshi Horinaga, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 11, 1973, Ser. No. 359,606
Claims priority, application Japan, May 15, 1972, 47-47922; May 15, 1972, 47-56590
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 B **11 Claims**

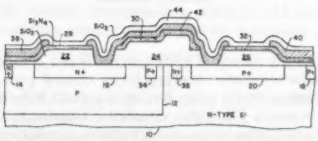


A switching circuit which utilizes a gate controlled switching device (GCS) or thyristor of the gate turn-off type has its gate connected with a series connection of another switching element and a voltage source and with a current supplying means arranged in parallel to the series connection. The other switching element, which may be a GCS or transistor, has its conductivity controlled by a control signal applied thereto, and the gate controlled switching device is supplied with a turn-off gate current from the voltage source through such other switching element when the latter is conductive, whereas the gate controlled switching device is supplied with a turn-on gate current from the current supplying means when the other switching element is non-conductive.

3,821,566
METHOD AND APPARATUS FOR ELECTRONICALLY RECOVERING METAL-NITRIDE-OXIDE SEMICONDUCTOR DEVICES EXPOSED TO RADIATION

James R. Cricchi, Catonsville, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 10, 1972, Ser. No. 233,447
Int. Cl. H01l *19/00, 11/14*
U.S. Cl. 307—304 **6 Claims**

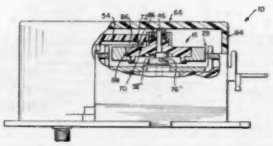


A method and apparatus for recovering the original characteristics of complementary metal-nitride-oxide semi-conductor devices after irradiation by periodic application of driving and gate voltages above the normal driving and gate voltages to the two complementary devices connected in series.

3,821,567
MEANS CORRECTING A WRONG-WAY DIRECTIONAL ROTATION OF A ROTATING MEMBER

Robert Dale Erwin, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Feb. 9, 1973, Ser. No. 331,022
Int. Cl. H02k *7/10*
U.S. Cl. 310—41 **10 Claims**

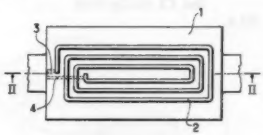


A rotor of a synchronous motor carries a projection such that when the rotor is axially displaced, the projection engages a stop means to stop a wrong-way directional rotation of the rotor. The stop means is a projection extending from the face of a gear driven by said motor.

3,821,568
ROTOR POLES FOR CRYO-ALTERNATORS

Roger Gillet, Belfort, France, assignor to Societe Generale de Constructions Electriques et Mecaniques (Alsthom), Paris, France

Filed July 10, 1972, Ser. No. 270,037
Int. Cl. H02k *1/32*
U.S. Cl. 310—54 **11 Claims**



A rotor pole for cryo-alternators, characterized in that the rotor winding is disposed therein within fluid-tight channels consisting of a continuous group of grooves or slots surrounding the axis of the pole, arranged in the rotor and closed off, after installation of the winding, by means of wedges welded to the upper part of the grooves or slots.

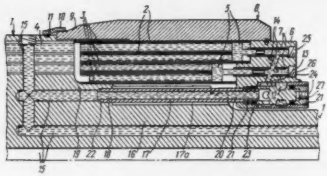
3,821,569
ELECTRIC MACHINE ROTOR

Nikolai Karlovich Sippol, Tamlovskaya ulitsa 67, kv. 13, and Alexandr Andreevich Saly, Prospekt Kosmonavtov, 92, kv. 227, both of Leningrad, U.S.S.R.

Filed Nov. 16, 1972, Ser. No. 307,227
Int. Cl. H02k *3/22, 3/24*
U.S. Cl. 310—64 **6 Claims**

The rotor structure of an electric machine rated at up to 2,000 mV and above, the rotor having a winding made up of pipes or hollow conductors through which a cooling liquid is passed. The rotor structure is characterized in a construction to provide the feed of a liquid coolant to the hollow conductors of the rotor winding from the shaft grooves as well as the discharge of the liquid coolant from the hollow conductors of the rotor winding into the shaft grooves. It employs a hydraulic manifold mounted on an overhanging retainer ring and comprising a pressure chamber and an overflow chamber as well as longitudinal channels, the pressure and overflow chambers being disposed intermediate of the longitudinal channels

and the manifold surface facing the rotor shaft, which longitudinal channels communicate with the chambers by way of channels lying in the radial planes of the manifold. The hydraulic manifold is connected with the rotor winding conductors by means of endpieces fixed on each pair of conductors and fitting into the longitudinal channels of the manifold, and with the rotor shaft via longitudinal mounted pipes. One end of each pipe fits into one of the shaft grooves at the base of the steel housing of the rotor shaft, whereas the other end fits into that manifold orifice which communicates with either the pressure chambers, or the overflow chamber.

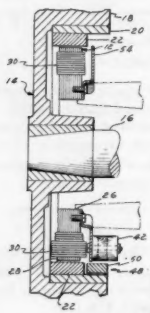


3,821,570

GENERATOR AND TRIGGERING DEVICE FOR ELECTRONIC IGNITION SYSTEM

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Sept. 11, 1972, Ser. No. 288,023
Int. Cl. H02p 9/40
U.S. Cl. 310—70 A **6 Claims**



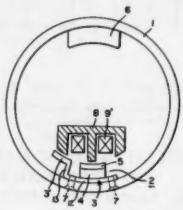
A generator and triggering mechanism for an electronic ignition system of an internal combustion engine in which the mechanism has one magnetic circuit which charges an energy storage device and which is discharged in response to periodic rotational positions of the engine shaft by which the generator is driven. Integral and relatively rotatable with the generator, the mechanism includes a second magnetic circuit comprising a triggering coil and pole piece disposed in offset axial relationship to the magnetic circuit of the generator and with a ferromagnetic disc interposed between the generator circuit and the triggering elements whereby the trigger coil is shielded from stray flux lines of the first magnetic circuit.

3,821,571

FLYWHEEL MAGNETO

Yoshihisa Honsho, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki, Tokyo, Japan

Continuation of Ser. No. 244,798, April 17, 1972, abandoned. This application Aug. 20, 1973, Ser. No. 389,674
Int. Cl. F02p 1/02
U.S. Cl. 310—70 R **7 Claims**



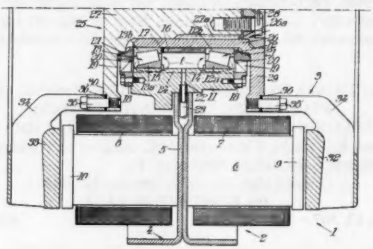
A flywheel magneto having one or more magnetic block assemblies composed of arc-shaped poles, ferrite magnets and substantially Z-shaped yokes, the component parts being appropriately secured to each other through thermosettable adhesive resin. The magnetic block assemblies are placed in a furnace for curing the resin, after which they are secured to the inner peripheral surface of a cylindrical flywheel of the magneto. The output capacities of the magnetos may be predetermined by the number of magnetic blocks utilized, as well as the particular materials employed and relative placement of the component parts.

3,821,572

EDDY CURRENT BRAKES

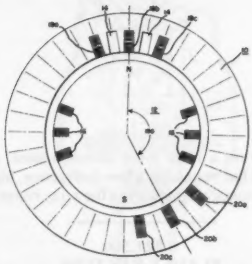
Pierre Etienne Bessiere, St. Nom-La-Breteche, France, assignor to Societe Labavia-S.G.E., Paris, France

Filed July 3, 1972, Ser. No. 268,796
Claims priority, application France, July 8, 1971, 71.25099
Int. Cl. H02k 49/12
U.S. Cl. 310—93 **7 Claims**



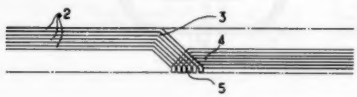
Independently mounted eddy current brake comprising an annular inductor stator bearing in its central portion, two coaxial bearings and a rotor having a central hub, borne by these two bearings. The hub is coupled in rotation to a shaft to be braked and connected to two armatures of revolution framing the inductor. The hub is constituted by a grooved sleeve and by a splined stub, adapted to coact together. The sleeve and the stub are coupled respectively to the armatures through transverse plates each assembled directly to a respective element of the shaft to be braked. The device is useful for vehicle brakes.

3,821,573
MULTISET POLYPHASE WINDING
David M. Willyoung, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Jan. 26, 1973, Ser. No. 326,851
Int. Cl. H02k *23/26*
U.S. Cl. 310—198 17 Claims



A multiset polyphase winding for a dynamoelectric machine having overlapping phase belts and providing a phase angle displacement between polyphase sets, accomplished by separating adjacent coil sides of one polyphase set by at least two stator slots and interspersing the coil sides of the remaining polyphase sets therebetween. For example, a single winding comprising two balanced three-phase sets would have 12, 60° phase belts with each phase belt of one three-phase set overlapping two phase belts of the other three-phase set by 30 electrical degrees as a result of the coil sides of one three-phase set occupying alternate slots with the coil sides of the other three-phase set.

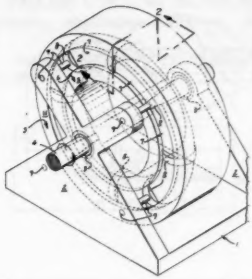
3,821,574
TRANSPOSED WINDING BAR FOR A HIGH-POWER ELECTRICAL MACHINE
Gilbert Ruelle; Jacques Carlier, and Henri Nithart, all of Belfort, France, assignors to Societe Generale de Constructions Electriques et Mecaniques (Alsthom), Paris, France
Filed July 21, 1972, Ser. No. 273,706
Claims priority, application France, July 22, 1971, 71.26963
Int. Cl. H02k *3/14*
U.S. Cl. 310—213 9 Claims



A winding bar for an electrical machine formed by a plurality of radially superimposed conductors each made up of a plurality of tangentially disposed strands, the conductors being periodically radially transposed in position and the strands being periodically tangentially transposed in position.

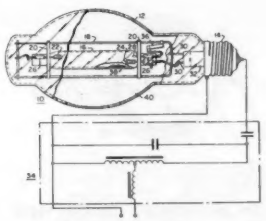
3,821,575
COMMUTATORLESS AND BRUSHLESS DIRECT CURRENT MOTOR OR GENERATOR
Richard L. Colosimo, 1008 Ticonderoga Dr., Sunnyvale, Calif. 94087
Filed Jan. 17, 1973, Ser. No. 324,558
Int. Cl. H02k *1/22*
U.S. Cl. 310—266 5 Claims

An electrical generator utilizes a rotating magnetic field and a stationary wound stator to produce direct current output without the aid of a commutator or brushes. The continuous winding utilizes circumferential and radial slots in which the elements of the winding are alternately and successively placed so that only the radial slots generate a flow of current.



The stator is arranged in segments, the connections between segments being magnetically shielded so as not to produce a flow of current and connected so that the flow would be additive and unidirectional. By supplying a direct current input the machine may be operated as a motor.

3,821,576
HIGH PRESSURE MERCURY-TITANIUM IODINE DISCHARGE LAMP WITH PHOSPHOR COATING
Daniel A. Larson, Cedar Grove, N.J., assignor to Westinghouse Electric Corporation, Pittsbrugh, Pa.
Filed Apr. 2, 1973, Ser. No. 347,081
Int. Cl. H01j *61/34, 61/42*
U.S. Cl. 313—25 2 Claims

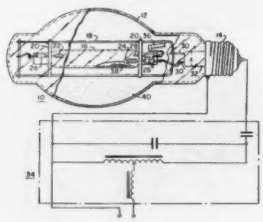


A high-efficiency, high-intensity blue-emitting discharge lamp combination in which, to the normal arc tube containing a predetermined amount of mercury and the normal outer envelope, there is added a phosphor coating of strontium chloroapatite activated by divalent europium onto the interior surface of the outer envelope and there is also added titanium and iodine as discharge sustaining additives in the arc tubes. This combination provides a substantially more efficient high-intensity source of blue light than previous sources and is especially useful in the medical and photocopying fields.

3,821,577
HIGH PRESSURE MERCURY CHROMIUM IODIDE DISCHARGE LAMP WITH PHOSPHOR COATING
Daniel A. Larson, Cedar Grove, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Apr. 2, 1973, Ser. No. 347,082
Int. Cl. H01j *61/34, 61/42*
U.S. Cl. 313—25 2 Claims

A high-efficiency high-intensity blue-emitting discharge lamp combination in which, to the normal arc tube containing a predetermined amount of mercury and the normal outer en-

velope, there is added a phosphor coating of strontium chloroapatite activated by divalent europium onto the interior surface of the outer envelope and there is also added chromium



and iodine as discharge sustaining additives in the arc tubes. This combination provides a substantially more efficient high-intensity source of blue light than previous sources and is especially useful in the medical and photocopying fields.

3,821,578

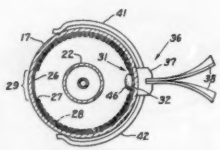
STABILIZATION OF MERCURY-VAPOR DISCHARGE LAMPS

Charles E. Beck, Chesterland, and D. Richard Zatyko, Richmond Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 10, 1972, Ser. No. 252,341

Int. Cl. H01j *9/44*

U.S. Cl. 313—44 **5 Claims**



A method for prestabilizing mercury-vapor discharge lamps, such as fluorescent lamps. After lamp assembly, the lamp is temporarily operated while at the same time cooling, to a temperature lower than its normal intended operating temperature, a small area of the bulb, at the normal "cold spot" location where the mercury will condense during lamp operation. This causes the mercury to quickly condense and adhere to the phosphor and bulb at the cold spot. The lamp may then be shipped and put into use without the need for any appreciable further stabilization.

3,821,579

X-RAY SOURCE

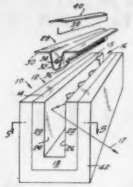
Stephen J. Burns, 24 French Rd., Rochester, N.Y. 14618

Continuation-in-part of Ser. No. 146,741, May 25, 1971, abandoned. This application Mar. 6, 1973, Ser. No. 338,544

Int. Cl. H01j *35/08*

U.S. Cl. 313—55 **29 Claims**

An x-ray source is disclosed for providing a brilliant, extremely low divergence, monochromatic x-ray beam. X-rays are generated by electron bombardment on the surfaces of a single crystal. The x-rays are subsequently repeatedly diffracted by an adjacent crystal surface. The x-ray beams emitted from the ends of the crystal in Bragg directions are monochromatic and with a divergence controlled by the diffraction process. The divergence of the emitted x-ray beams is independent of the final focal spot geometry. This permits



heat transfer from a large x-ray emission area, a relatively large focal area but maintains a low divergence, high intensity and improved monochromaticity in the x-ray beam.

3,821,580

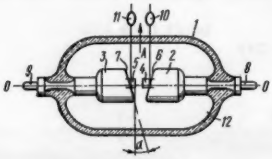
FLASH X-RAY TUBE

Eduard-Gely Vitalievich Alexandrovich, ulitsa Pobedy, 19, kv. 10; Nikolai Vasilievich Belkin, ulitsa Pobedy, 11, kv. 39; Konstantin Fedorovich Zelensky, oktyabrsky Prospekt, 19, kv. 3; Mikhail Alexeevich Kanunov, ulitsa Pushkina, 26, kv. 11; Anatoly Alexandrovich Razin, Prospekt Lenina, 32, kv. 16; Ljudmila Viktorovna Tarasova, ulitsa Zhdanova, 13, kv. 2; Anatoly Pavlovich Toropov, Prospekt Lenina, 7, kv. 11; Ivan Andreevich Troshkin, ulitsa Ushakova, 14, kv. 11; Ljubov Nikolaevna Khudyakova, Severny Pereulok, 8, kv. 24; Veniamin Aronovich Tsukerman, ulitsa Naberezhanaya, 1, kv. 1, all of Moscow; Ninel Alexeevna Dron, Kostromskol Prospekt, 22, kv. 71, Leningrad; Galina Nikolaevna Sloeva, Prospekt Narodnogoopolechenia, 177 kv. 62, Leningrad; Jury Konstantinovich Ioffe, Budapeshtskaya ulitsa, 42, Korpus 3, kv. 103, Leningrad, and Vasily Vasilievich Vasiliev, Moskovsky Prospekt, 172, kv. 102, Leningrad, all of U.S.S.R.

Filed Dec. 23, 1971, Ser. No. 211,204

Int. Cl. H01j *35/04*

U.S. Cl. 313—56 **6 Claims**



A flash X-ray tube having two electrodes, each electrode being provided with means for effecting autoelectronic emission adapted to bring about emanation of X-rays, respectively, from the other one of the two electrodes. The electrodes are so constructed and arranged in the tube that they ensure emanation of X-rays in a specified direction.

3,821,581

TARGETS FOR X-RAY TUBES

William P. Holland, West Redding, and Thomas J. Koller, Trumbull, both of Conn., assignors to The Machlett Laboratories, Incorporated, Springdale, Conn.

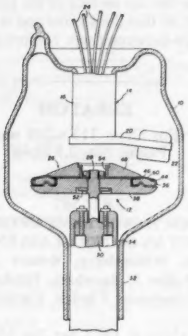
Filed Aug. 2, 1971, Ser. No. 168,330

Int. Cl. H01j *35/10*

U.S. Cl. 313—60 **8 Claims**

An X-ray tube including a target structure having a focal area for receiving electrons from an adjacent cathode and generating X-radiation in response thereto, the focal area

being provided with a surface designed to improve thermal properties such as by covering with a closely packed wrapping



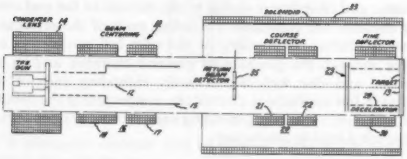
of relatively fine wire, the focal area preferably being a wire-wrapped annulus sandwiched between two discs of high thermal conductivity material.

3,821,582

METHOD AND APPARATUS FOR RETURN BEAM READOUT THROUGH A MATRIX ELECTRON LENS

William C. Hughes, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 2, 1972, Ser. No. 294,018
Int. Cl. H01j *31/48*
U.S. Cl. 313—394 **14 Claims**



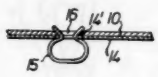
An electron beam-addressable memory apparatus and method for writing information on a memory target and reading information stored thereon are disclosed. Readout of stored information is achieved by scanning a primary electron beam across the target and detecting the secondary electrons emitted therefrom. The primary electron beam is directed first to a specific lenslet of a matrix electron lens by a coarse deflection assembly and then to a precise location on the target by a fine deflection assembly. Secondary emission electrons emanating from the surface of the target as a result of the primary electron beam are focussed back to the matrix electron lens and then are directed along a trajectory substantially similar to that of the primary electron beam to an electron detector. Since the number of detected electrons is modulated by the information stored on the target, information representative of digital data is conveniently stored and efficiently read out from the memory.

3,821,583

COLOR TUBE HAVING FUNNEL SHIELD ATTACHED TO SHADOW MASK FRAME

Karl Steiner, Ay/Iller, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed July 7, 1971, Ser. No. 160,300
Claims priority, application Germany, July 7, 1970, 2033558
Int. Cl. H01j *29/06, 31/20, 29/08*
U.S. Cl. 313—407 **3 Claims**



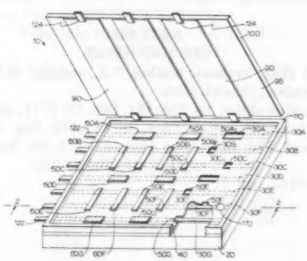
A color television picture tube including a glass tube vacuum vessel having a front screen portion, a conical portion and neck portion; with a ferromagnetic shielding funnel configured for reception within the conical portion, support means attached to said tube for supporting the funnel within the conical portion, and fastening means attached to the funnel for releasably connecting the funnel to the support means.

3,821,584

GAS-FILLED DISPLAY DEVICE HAVING MERCURY INLET SHIELD

Jacob Scovronek, South Plainfield, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 30, 1972, Ser. No. 267,900
Int. Cl. H01j *61/28*
U.S. Cl. 313—174 **8 Claims**



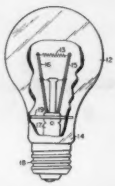
The display panel comprises a gas-filled envelope which includes a base plate on which a plurality of groups of cathodes and their conductors are formed, each group of cathodes being operable to display a character. The envelope also includes a face plate, spaced from the base plate, and carrying transparent conductive anodes, each associated with one group of cathodes. The base plate of the panel is provided with a hole and a short, small-diameter tube axially aligned with the hole and extending away from the outer surface of the base plate. The usual tubulation is secured to the outer surface of the base plate enclosing the hole and the short tube, and the desired gas and mercury vapor are introduced into the panel envelope through the tubulation and through the short tube and hole in the base plate. The short tube prevents large mercury globules, which might be present in the sealed-off tubulation, from accidentally getting into the panel envelope.

3,821,585

TUNGSTEN-HALOGEN INCANDESCENT LAMP WITH GROUP IVA METAL GETTER, AND METHOD OF MANUFACTURE

Sven A. Jansson, and Earl A. Gulbransen, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 30, 1973, Ser. No. 356,017
Int. Cl. H01j *61/26*
U.S. Cl. 313—178 **10 Claims**



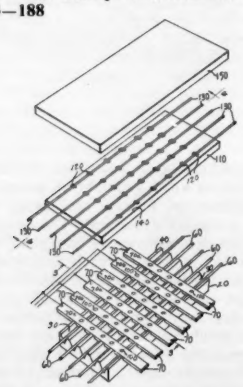
An incandescent lamp having a tungsten filament is dosed with a small carefully-controlled quantity of iodine or bromine gas and concurrently purged of water, oxygen, hydrogen, carbon monoxide and carbon dioxide by placing a selected amount of hafnium iodide, titanium iodide, or zirconium iodide (or bromides of such metals) within the envelope during lamp manufacture. The additive material, upon being heated by the filament when the latter is first energized, volatilizes and releases iodine (or bromine) gas and provides free hafnium, titanium or zirconium (Groups IVA metals) within the finished lamp which serves as a getter and eliminates the water cycle. The desired halogen-dosing and gettering action can also be achieved by forming a composite consisting of a thermally-decomposable halide which is disposed in a matrix of the getter-metal (or an alloy thereof) and placing it inside the envelope in heat-receptive relationship with the filament. A getter-metal (or alloy) component that is precharged with iodine or bromine gas and releases the latter when heated can also be employed.

3,821,586

DISPLAY PANEL

James A. Ogle, Neshanic Station, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 208,181, Dec. 15, 1971, abandoned, which is a continuation of Ser. No. 855,448, Aug. 18, 1969, abandoned. This application Aug. 20, 1973, Ser. No. 389,581
Int. Cl. H01j *17/04*; **H05b** *37/00*
U.S. Cl. 313—188 **20 Claims**



The display panel comprises first and second layers of communicating gas-filled display cells. The first layer includes a first plate having grooves, with first electrodes seated in the grooves, and second electrodes supported by the plate so that the first and second electrodes and the gas in the slots between them form a first layer of cells. The second layer includes a second plate having either grooves or apertures seated on the second electrodes, with third electrodes in the grooves of the second plate or on the top surface of the plate where an apertured plate is used, so that the second and third electrodes and the gas-filled space between them comprise the second layer of cells.

ERRATUM

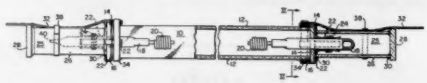
For Class 313—209 see:
Patent No. 3,820,487

3,821,587

CERAMIC DISCHARGE LAMP OPERABLE IN AIR WITHOUT AN OUTER GLASS ENVELOPE

Irving Liberman, Wilkinsburg; Robert J. Zollweg, Monroeville, and Walter J. Burnham, Pittsburg, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1973, Ser. No. 339,490
Int. Cl. H01j *61/36*
U.S. Cl. 313—217 **9 Claims**



A ceramic discharge lamp operable in air without a conventional sealed outer glass envelope with all external parts being constructed of a non-oxidizable material. The lamp includes a conventional light-transmissive tubular ceramic body closed at its ends by ceramic end discs having refractory metal exhaust and fill tubulations extending therethrough which carry the discharge sustaining electrodes at their inner ends. A ceramic end chamber is sealed to the outside of the end discs and encloses the outwardly extending ends of the refractory metal tubulation. A plurality of platinum foil conductors are sealed through the juncture of the end chamber and its associated end disc with the inwardly extending ends of the platinum foil conductors electrically connected to the tubulation and their outwardly extending ends electrically connected to the lamp lead-in conductors.

3,821,588

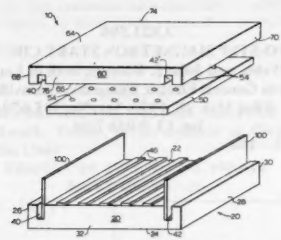
DISPLAY PANEL HAVING FLAT SIDE EDGES TO PERMIT BUTTING TOGETHER PLURAL PANELS

George J. Przybylek, Scotch Plains, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 8, 1973, Ser. No. 339,320
Int. Cl. H01j *17/18*
U.S. Cl. 313—220 **4 Claims**

A display panel includes a base plate and a face plate to define a housing which is filled with gas and which contains any desired form of display device including, for example, segmented cathode glow electrodes or a matrix of dot-like cells, each having an anode and a cathode electrode. Assuming that a plurality of such panels are to be butted along adjacent side edges, then along these side edges of the base plate and face plate, the lower surface of the face plate and the top surface of the base plate are provided with aligned channels. Thus, each panel has two pairs of aligned channels. A rigid thin plate is inserted in each pair of channels, and the remainder of the chan-

nels, not taken up by the thin plates, and the space between the plates adjacent to the outer edges thereof are filled with a sealing material such as a glass frit which can be fused by the



application of heat, and which cools to form a gas-tight seal. In this panel, the side edges are flat, and a plurality of such panels can be butted together to provide a combination large-area panel.

3,821,589

STORAGE CATHODE PARTICULARLY A MK CATHODE

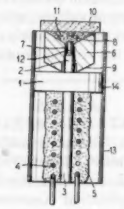
Helmut Katz, and Erwin Huebner, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 8, 1973, Ser. No. 339,325

Claims priority, application Germany, Mar. 29, 1972, 2215477

Int. Cl. H01j *1/14, 19/06*

U.S. Cl. 313—346 R **16 Claims**



A dispenser cathode and method of making the same, in which the cathode structure comprises a cylindrical container, open at one side, adapted to form a supply chamber for a charge of emission-promoting material, with the open side of the container being closed by a porous plate tightly sealed thereto, having a threaded bore therein adapted to mate with a threaded central column extending from one side of a solid disc of refractory metal, which has a similar central column at the opposite side thereof, which carries an insulated heater. The cylindrical container is provided with a wad of tungsten wire disposed adjacent the porous plate, and the heater is adapted to be secured to the second column of said disc by a cement sintered thereon in a high temperature operation. The wad of tungsten is initially disposed in the cylindrical container and the porous plate secured thereto, for example by welding, to form a sub-assembly, and in like manner the heater is secured to the second column by means of a cement, utilizing a sintering operation, with the two sub-assemblies, following insertion of the charge of emission-promoting material through said bore, into said container the latter is threaded on said threaded column, with an edge of the cylindrical container bearing on said solid disc to form a seal therebetween.

3,821,590

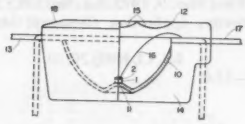
ENCAPSULATED SOLID STATE LIGHT EMITTING DEVICE

Karel Jan Williams Kosman, and Louis-Philippe Boivin, both of Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Continuation-in-part of Ser. No. 129,028, March 29, 1971. This application Feb. 24, 1972, Ser. No. 229,140

Int. Cl. H01j *1/62, 63/04*

U.S. Cl. 313—499 **4 Claims**



A light emitting device containing an encapsulated light emitting diode, in which the light from the diode is collimated by a reflector and in which the front face of the encapsulated diode is formed with a plurality of lenses which disperse the collimated light. The device can be viewed over a wide angle, for example ±45°, without a readily apparent reduction in brilliance or size. An optical filter—for increased contrast for example—can be used. More than one diode can be positioned in a device. Variation in the form of the lenses provides increased luminous intensity for particular viewing angles and by accepting some loss in effectiveness, for example some sectoring, the viewing angle can be increased up to approximately ±90°.

3,821,591

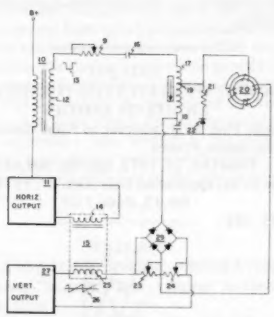
CIRCUIT FOR DRIVING QUADRIPOLE CONVERGENCE MEANS

John W. Lister, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed Jan. 10, 1973, Ser. No. 322,276

Int. Cl. H01j *29/70*

U.S. Cl. 315—13 C **10 Claims**



A circuit for deriving suitably shaped current waveforms, modulated at both a horizontal and a vertical scansion rate, and combining them to energize a quadripole-type convergence winding. Retrace pulses derived from a horizontal output transformer are applied by way of a waveshaping circuit to a first end of the convergence winding. A voltage waveform derived from the vertical deflection current is applied to a rectifier and passed through waveshaping circuitry to provide

a vertical-rate current waveform to the convergence winding. The circuitry used for shaping the vertical rate current waveform presents a high impedance to horizontal-rate signals so that no crosstalk between horizontal and vertical deflection systems occurs.

3,821,592

VERTICAL DEFLECTION CIRCUIT FOR A COLOR TELEVISION CAMERA HAVING DIFFERENT RASTER SIZES IN ITS CHANNELS

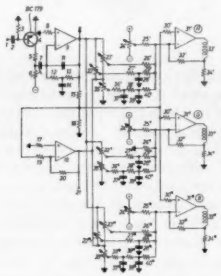
Emil Siegel, Darmstadt-Arheilgen, Germany, assignor to Robert Bosch Fernsehanlagen GmbH, Darmstadt, Germany

Filed Mar. 9, 1973, Ser. No. 339,534

Claims priority, application Germany, Mar. 11, 1972, 2211867

Int. Cl. H01j *29/50*

U.S. Cl. 315—13 C **9 Claims**



An improvement in the deflection circuit of a color television camera with a plurality of pick-up tubes of different raster sizes, where difficulties arise from the necessity of correcting geometric errors, bringing the rasters into electrical registration and stabilizing this registration against temperature fluctuations. A single vertical deflection generator supplies each of the pick-up tubes, and operational amplifiers fed by this deflection generator are connected to sets of deflection coils. The amplification factors of each amplifier are adjusted by measurement resistors of different size corresponding to the size of the raster, but of equal temperature coefficient. Other single function generators in parallel to the deflection generator may be connected to the operational amplifiers by way of potentiometers.

3,821,593

METHOD AND APPARATUS FOR TURNING VEHICLE LIGHTS ON AND OFF

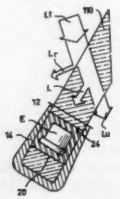
Sergio Roselli, Pise, Italy, assignor to Saint Gobain Industries, Neuilly-sur-Seine, France

Filed Oct. 25, 1972, Ser. No. 300,683

Claims priority, application Italy, Oct. 27, 1971, 30416/71

Int. Cl. B60q *1/08*

U.S. Cl. 315—82 **18 Claims**



A method of electrically activating apparatus from a variable source of light which comprises illuminating a pane of transparent material with the light from the variable source, illuminating a light responsive electric cell, shielded from other light, with the light that flows parallel to and within the broad surfaces of the pane, and utilizing the output of the cell to activate the apparatus.

3,821,594

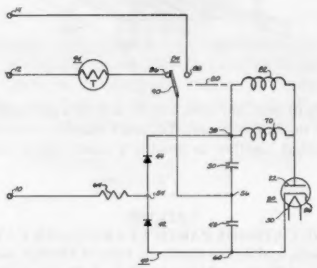
TWO-STEP MAGNETRON START CIRCUIT

Robert F. Webb, and John J. Roberts, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 28, 1973, Ser. No. 345,678

Int. Cl. H01h *7/06*

U.S. Cl. 315—104 **6 Claims**



A control arrangement for stepped energizing of a magnetron in a microwave oven includes means to delay the application of the full high voltage to the magnetron to insure operation in the desired oscillating mode. Such delay is accomplished by providing a thermistor coupled serially with an input terminal of a voltage doubler, such that upon magnetron conduction, the current flowing through the thermistor causes a decrease in resistance therein which in turn produces an increase in the doubler output voltage, whereupon the reaching of a predetermined level thereof, a relay effects switching to apply full line voltage to the voltage doubler input terminals.

3,821,595

IRRADIATION LAMP SYSTEM

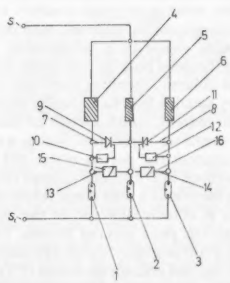
Edwin Muz, Muhlbach, Germany, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Apr. 2, 1973, Ser. No. 346,821

Claims priority, application Germany, Apr. 7, 1972, 2216722

Int. Cl. H01j *1/60*; **H05b** *4/16*

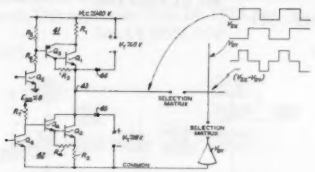
U.S. Cl. 315—129 **3 Claims**



An irradiation system comprises at least three lamp circuits of the gas vapor type connected electrically in parallel to an alternating current voltage source, each lamp circuit includes

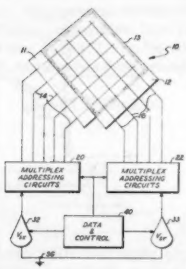
an impedance connected in series with the lamp, and each of the two outer lamp circuits is connected with the intermediate lamp circuit by a bridge located between the lamp and its impedance. Each bridge includes a thyristor and a trigger circuit therefor and a current circuit each of which contains a high-ohmic relay having contact means operable to actuate indicators for the lamps to show their respective operating conditions.

3,821,596
SUSTAINER VOLTAGE GENERATOR
Donald D. Leuck, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 19, 1971, Ser. No. 190,614
Int. Cl. H05b *37/00*
U.S. Cl. 315—169 TV **6 Claims**



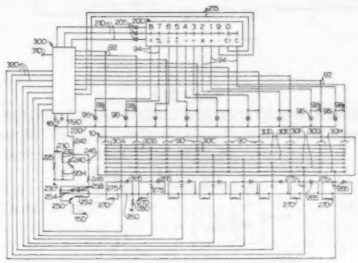
There is disclosed an improved sustaining voltage supply system, particularly for driving a capacitive load, as for example a gas discharge display panel having row-column conductor arrays, the matrix cross points of which are non-conductively coupled to a gaseous discharge medium in the panel. In a preferred arrangement, a pair of series connected, constant current transistor circuits, clamped by parallel diodes, have the intermediate points thereof connected to supply the sustainer voltages to the panel. There constant current sources are connected across the direct current voltage source so that the displacement currents to the panel are supplied with very low notching on high current commands with better tracking of input signals thereto.

3,821,597
METHOD AND APPARATUS FOR OPERATING GASEOUS DISCHARGE DISPLAY/MEMORY PANELS IN SATURATION MODE
William D. Petty, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed May 8, 1972, Ser. No. 251,007
Int. Cl. H05b *39/00*
U.S. Cl. 315—169 TV **4 Claims**



There is disclosed an improved method for controllably operating gaseous discharge display/memory panels. The operating control pulses include discharge initiating and/or discharge terminating pulses, each selected pulse being of a magnitude such that every discharge associated with each selected pulse occurs in the saturation mode and the effects of panel non-uniformity are minimized.

3,821,598
DRIVE SIGNAL STORAGE AND DIRECT DRIVE IN DISPLAY SYSTEMS
George E. Holz, North Plainfield, N.J., assignor to Burroughs Corporation, Detroit, Mich.
Filed July 13, 1972, Ser. No. 271,591
Int. Cl. H05b *37/02*
U.S. Cl. 315—169 R **12 Claims**



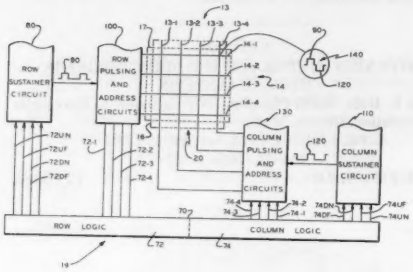
Apparatus addressing multi-position display devices directly from semiconductor integrated circuits and passive driving of the display electrodes also from such circuits. The apparatus determines the magnitude of the bias voltage and of the selection signals that are applied to operate threshold-responsive devices, including gas discharge display tubes and panels, independent of the input data signals. Energy for a segmented display is accumulated in a plurality of capacitance elements, responsive to input data pulses of a first polarity, and the opposite potential from them then activates the device. This develops the necessary potential of proper polarity for operating the display, without need of active inverters for the input signals.

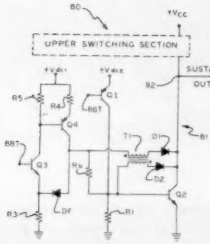
In one system the storage capacitors are automatically charged to a potential from which selection pulses of predetermined duration can further charge them sufficiently to ionize a display position. The cathode bias which proved to be suitable for a particular display device is stored between display periods and signal blanking is introduced between display periods on the data lines which connect to the display electrodes. The apparatus also improves the uniformity of brightness of different display patterns and enables the control of display brightness by variation of the rate at which the apparatus is pulsed.

3,821,599
TRANSISTOR CONTROL APPARATUS
Edwin F. Peters, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 8, 1972, Ser. No. 313,273
Int. Cl. H05b *39/00*
U.S. Cl. 315—169 TV **18 Claims**

There is disclosed a system utilizing transistor control apparatus for supplying operating potentials which is particularly useful with load devices wherein at least two transversely oriented conductors are dielectrically isolated from a gaseous discharge medium between the conductors. The invention is illustrated in wave form generators, each having at least one output transistor. Novel transformer-diode clamping means are provided to automatically sense saturation of an output

transistor and to reverse bias the collector-base junctions of the output transistors, to bring deeply saturated transistors out of saturation and enable them to turn off much more rapidly than was possible heretofore. The system shown thus produces





a more effective wave form having steeper leading and trailing edges, the wave form in the embodiment shown being used as a sustaining voltage for cells in a gas discharge display/memory panel.

3,821,600

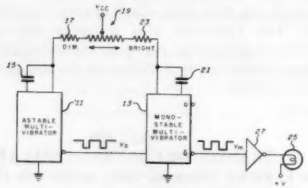
VARIABLE INTENSITY ILLUMINATOR

Charles R. Wesner, Crozet, Va., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 29, 1972, Ser. No. 267,342

Int. Cl. G05f *1/02*

U.S. Cl. 315—291 **5 Claims**



Variable illumination apparatus includes means for closely controlling the voltage to a lamp so that low values of illumination can be readily adjusted. The frequency of an astable multivibrator is adjusted through a potentiometer coupling the astable multivibrator to a voltage source. Each pulse from the astable multivibrator drives a monostable multivibrator into its quasi-stable state. The time that the monostable multivibrator remains in the quasi-stable state is adjusted by the same potentiometer that adjusts the frequency of the astable multivibrator in such a way that the quasi-stable time duration increases as the pulse repetition rate of the astable multivibrator increases. The circuit is proportioned so that the quasi-stable pulse duration is longer than the pulse repetition period of the astable multivibrator when the astable multivibrator is operating at its maximum rate, so that under these conditions the monostable multivibrator is clamped in its quasi-stable state. The load is taken from the complementary output terminal of the monostable multivibrator so that lamp voltage decreases to zero as the repetition rate and pulse duration is increased.

3,821,601

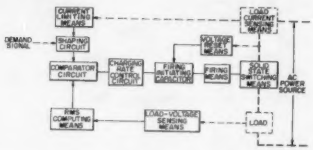
REGULATED DIMMER FOR INCANDESCENT LAMPS

George A. Kappenhagen, Itasca, and James B. Tabor, Wheaton, both of Ill., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 13, 1973, Ser. No. 370,134

Int. Cl. G05f *1/00*

U.S. Cl. 315—311 **7 Claims**



A regulated lighting control apparatus to control RMS voltage supplied to an incandescent lamp load from an A.C. power source in response to an electrical demand signal. This apparatus utilizes a comparison between a signal which is a function of the demand signal and a signal proportional to the RMS value of the voltage across the load to control the amount of power supplied to the load. The apparatus also contains a voltage reset means to periodically restore the firing initiating capacitor to a predetermined voltage. Preferably the apparatus also senses the load current, and if the current tends to rise above the rated current of the apparatus, the comparison of the signals is modified so as to prevent the drawing of excess current.

3,821,602

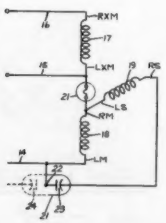
THERMALLY PROTECTABLE MULTISPEED MOTOR

Clovis E. Linkous, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Nov. 20, 1972, Ser. No. 308,180

Int. Cl. H02h *7/08*

U.S. Cl. 317—13 B **10 Claims**



Multispeed single phase induction motor has plural main winding sections and an auxiliary winding arranged in distributed coil groups on a slotted magnetizable core. Single thermal protector connected in series with all of main winding sections; one end of auxiliary winding connected with thermal protector and high speed main winding section. Conductor ex-

tends from the other end of auxiliary winding to a point accessible from motor exterior. Other conductors extend to be accessible from motor exterior for selective connection to power source. The polar axis of each auxiliary coil group is displaced a predetermined angle B (measured in electrical degrees) from a next adjacent main winding coil group polar axis. Motors embodying invention have improved low speed starting torque; less output torque pulsation; less heat loss; less power input requirements; better efficiency; and that require less operating current for any given speed — all while using less winding conductor than heretofore. In some designs, smaller capacitor for the auxiliary winding can be used than heretofore in motors optimized for same given application.

3,821,603

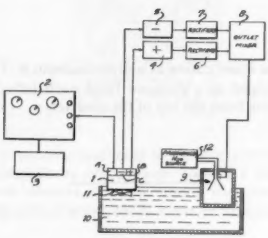
ELECTROSTATIC DISCHARGING SYSTEM

Juan J. De La Cierva, Apolonio Morales 21, Madrid, Spain

Continuation of Ser. No. 239,567, March 30, 1972, abandoned. This application Feb. 20, 1973, Ser. No. 333,656

Int. Cl. H05f *3/00*

U.S. Cl. 317—2 D **11 Claims**



The electrostatic environment inside an oil carrier tank is measured through a sensor which produces an alternating current output signal which is fed separately to two power units, one of which produces a signal if the polarity of the field sensed is positive and the other of which produces a signal if the polarity of the field sensed is negative, each circuit amplifying its specific signal to a predetermined level. The parallel circuits are connected to a high voltage circuit which produces an electrostatic field having a predetermined polarity and a magnitude which is proportional to the electrostatic field sensed. The generated electrostatic field is applied to an ionizer nozzle through which water is sprayed into the tank. The water is electrostatically charged by the nozzle to have a polarity opposite to the polarity sensed by the sensor and effectively neutralizes the electrostatic charge within the tank.

3,821,604

ARRANGEMENT FOR SYNCHRONIZING TWO SIGNALS

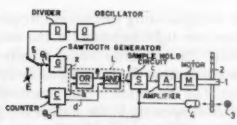
Anthonie Walraven, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 26, 1972, Ser. No. 318,510

Claims priority, application Netherlands, Jan. 13, 1972, 7200484

Int. Cl. H02p *5/00*

U.S. Cl. 317—5 **15 Claims**



Arrangement for synchronizing a measuring signal produced by a controllable generator with a reference signal. For motor speed control the generator is a system which is coupled to the motor shaft and provides a measuring signal the frequency of which is a measure of the motor speed. The arrangement includes a four-position counter the count of which is increased one position by each reference pulse and is reduced one position by each measuring pulse. The arrangement further includes a sawtooth generator which provides a signal which is in synchronism with the reference signal and is applied to a logic circuit. This logic circuit is so controlled by the four-position counter as to provide an output signal which, after sampling at instants which correspond to the measuring pulses, produces a control signal which has an extreme value if the frequencies of the measuring and reference signals are different and has a value determined by the phase difference if the frequencies are equal. The great advantage of the arrangement is that the motor speed is adjustable over a wide range without stability problems arising.

3,821,605

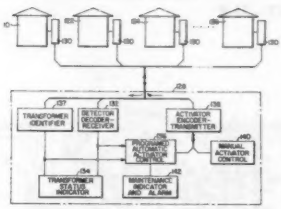
REMOTE TRANSFORMER MONITORING SYSTEM

Johnny M. Pendrak, Athens, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1972, Ser. No. 279,567

Int. Cl. H02h *7/04*

U.S. Cl. 317—14 R **14 Claims**



Apparatus for detecting and controlling transformer conditions at a remote location. Detecting sensors and activating controllers are located within the transformer for detecting certain existing conditions of the transformer and for applying control signals for changing the transformer conditions. Signals from the detecting sensors are transmitted to a remote monitoring station where they are processed and displayed. Signals are originated at the remote monitoring station and transmitted to the activating controllers to change the transformer conditions.

3,821,606

POWER SUPPLY FOR GAS DISCHARGE DISPLAY PANEL SYSTEMS

Leonard M. Buozynski, Toledo, Ohio, assignor to Owens-Illinois, Toledo, Ohio

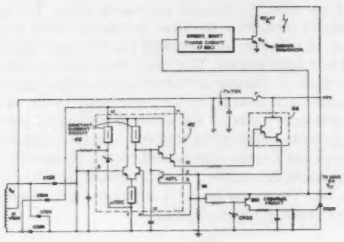
Filed Oct. 24, 1972, Ser. No. 300,285

Int. Cl. H02h *3/20*

U.S. Cl. 317—16 **3 Claims**

There is disclosed a multiple output power supply for supplying direct time potentials to circuits for operating gas discharge panels including sustainer and addressing supplies, border boost and bias supplies. The circuit has reduced power

dissipation in sustainer and addressing supplies series pass transistors by phase controlling these devices; a simplified



border boosting circuit, and an improved border sequencer. The power supply allows the display panel system to operate in the write mode as soon as the power supply is energized.

3,821,607

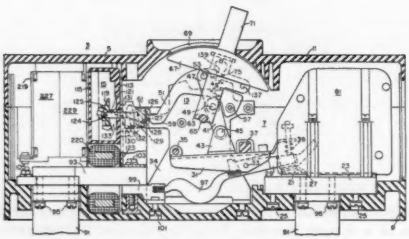
CIRCUIT INTERRUPTER PROTECTIVE DEVICE

Joseph J. Matsko, Coraopolis; Robert H. Hill, Beaver Falls, and Emroy W. Lange, Beaver, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 29, 1972, Ser. No. 319,824

Int. Cl. H02h *1/00*

U.S. Cl. 317—33 R **4 Claims**



A circuit interrupter protective device characterized by a circuit breaker, a trip member, a solid-state static sensoring means, and a first insulating housing therefor; the solid-state static sensoring means being contained within a second insulating housing within the first insulating housing; and the trip member being contained within a third insulating housing within the first insulating housing.

3,821,608

ENCLOSED SURGE DIVERTER

Arne Johansson, Grangesberg, and Bertil Lyckstedt, Ludvika, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

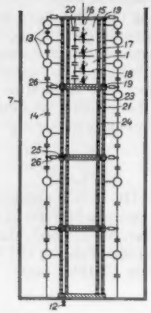
Filed Apr. 6, 1973, Ser. No. 348,751

Claims priority, application Sweden, Jan. 31, 1973, 73013104

Int. Cl. H02h *1/04*

U.S. Cl. 317—62 **5 Claims**

A surge diverter is mounted in an inner casing of electrically insulating material which is enclosed in an outer housing of electrically conducting material which is connected to earth. In the space between the inner casing and the housing a number of grading rings in the form of toroid rings are



fastened to the inner casing at a distance from it. The grading rings are arranged at a distance from each other which increases counting from the top of the diverter.

3,821,609

EXPLOSION-PROOF HOUSING MEANS FOR ELECTRICAL CIRCUITRY USED IN MINING MACHINERY

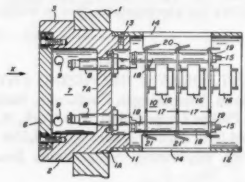
Karl-Heniz Weber, Witten-Heven, Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed Aug. 29, 1973, Ser. No. 392,630

Claims priority, application Germany, Sept. 8, 1972, 2244070

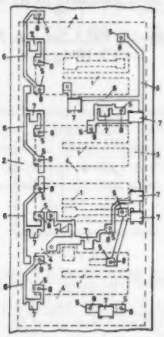
Int. Cl. H02b *1/10, 1/12*

U.S. Cl. 317—99 **6 Claims**



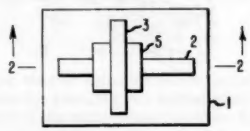
Apparatus for encapsulating electrical circuitry for mining machines in a pressure-tight housing for the mining machine drive motor means, the circuitry being adapted to connect high voltage elements within the housing to an external, intrinsically-safe circuit. The invention is characterized in the use of an insert fitted into an opening in the wall of the pressure-tight housing for the drive motor means, the insert carrying electrical coupling elements for interconnecting high voltage circuitry to low voltage circuitry and incorporating an explosion-proof chamber.

3,821,610
THICK FILM CIRCUITRY
Thomas Lyn Harcombe, Efail Isaf, Pontypridd Glamorgan, Wales, assignor to A.B. Electronic Components Limited, Glamorgan, Wales
Filed Feb. 27, 1973, Ser. No. 336,178
Claims priority, application Great Britain, Mar. 1, 1972, 9610/72
Int. Cl. H05k 5/00
U.S. Cl. 317—101 C 4 Claims



In order to provide screening to prevent unwanted coupling between components on opposite sides of a thick film substrate circuit element, components on one side are located directly opposite printed earth areas of components in the other side.

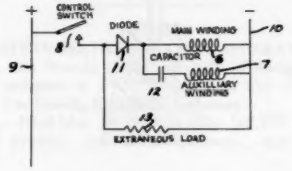
3,821,611
CROSS CONDUCTORS WITH DOUBLE LAYERED INSULATION
Rudolph John Bacher, New Castle, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Sept. 21, 1973, Ser. No. 399,726
Int. Cl. H05k 1/04
U.S. Cl. 317—101 CE 9 Claims



The present disclosure relates to thick film dielectric layers which exhibit low dielectric constants and reduced tendency to permit sinking of the top electrode into the dielectric during firing, the dielectrics having two layers. The first layer is a borosilicate glass layer with an optional additional phase of finely divided silica, and the second layer is a glass ceramic. The dielectrics are useful in multilayer circuitry, especially as cross-over dielectrics.

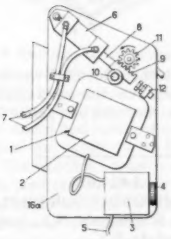
3,821,612
FAST RESPONSE SOLEINOID
George L. Webb, Fond Du Lac, Wis., assignor to Deltrol Corp., Bellwood, Ill.
Filed Apr. 2, 1973, Ser. No. 347,356
Int. Cl. H01h 47/00
U.S. Cl. 317—151 4 Claims

A fast operate-fast release direct current solenoid includes a main winding and an auxiliary winding having equal turns. The windings are connected in parallel to a control switch. A capacitor is connected in series with the auxiliary winding only and a diode is interposed between the control switch and both



windings. When the control switch is closed, both windings are energized, causing fast pull in. The capacitor then charges and stops current to the auxiliary winding. When the control switch opens, the capacitor discharges through both coils.

3,821,613
METHOD AND APPARATUS FOR DEMAGNETIZING MECHANICAL PARTS
Jean Fauve, Alfortville, France, assignor to SKF Compagnie D'Applications Mecaniques, Newton, France
Filed Oct. 16, 1972, Ser. No. 297,676
Claims priority, application France, Oct. 21, 1971, 71.37920
Int. Cl. H01f 13/00
U.S. Cl. 317—157.5 3 Claims

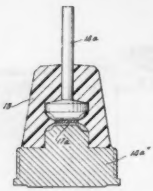


Mechanical parts are demagnetized by passing them by the end of an induction coil, perpendicular to the lines of force of the magnetic field induced by the coil. The coil forms part of a resonant circuit the parameters of which are so selected that resonance is achieved only when a part to be demagnetized is within the magnetic field.

3,821,614
SEMI-CONDUCTOR UNIT WITH FLOW-DEPOSITED SOLDER
Gunther Schmidt, Ludwigsburg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Division of Ser. No. 248,520, April 28, 1972. This application Apr. 4, 1973, Ser. No. 347,917
Claims priority, application Germany, May 5, 1971, 2122104
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 4 Claims

A semi-conductor element is to be connected with one or more conductor members by soft-soldering. The conductor member is provided with a nose-like projection having circumferential surface portions and a free end face which is planar and with which the circumferential surface portions

define acute angles. Liquid solder is flow-deposited on the surface portions and on the end face, forming a solder-coating on



them, particularly on the surface portions, and the coated end-face is in abutment with the semi-conductor element and soldered thereto.

3,821,615

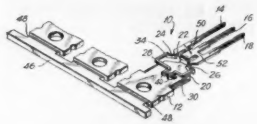
LONG LIFE LEAD FRAME MEANS FOR SEMICONDUCTOR DEVICES

Donald B. Nordstrom, Lake Park, and Peter Napierkowski, North Palm Beach, both of Fla., assignors to Solitron Devices, Inc., Tappan, N.Y.

Filed May 16, 1973, Ser. No. 360,734

Int. Cl. H01l *5/02*

U.S. Cl. 317—234 R **3 Claims**



A lead frame for a semiconductor device having a plurality of skinny leads with larger contact areas adapted to permit assembly of the device to the frame and permit longer life cycles of operation.

3,821,616

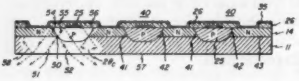
MONOLITHIC SEMICONDUCTOR DISPLAY DEVICES

Lawrence C. Kravitz, Schenectady, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Filed Oct. 16, 1972, Ser. No. 297,809

Int. Cl. H01l *15/00;* **H05b** *33/16*

U.S. Cl. 357—29 **12 Claims**



A substrate wafer of semi-insulating semiconductor material is provided with a first plurality of substantially parallel stripes of one conductivity type in one of the opposed faces thereof, each of the stripes extending from the face inward a first distance. A second plurality of substantially parallel stripes of opposite conductivity type is provided extending inward from the same face a second distance greater than the first distance. The first and second plurality of stripes form a plurality of light emitting diodes. A first plurality of high conductivity films in contact with the first plurality of stripes and a second plurality of high conductivity films in contact with the secondary plurality of stripes provide electrical connection to the array of diodes from the same side of the substrate. Such a structure provides a pair of P-N junctions in the diodes of a small cross-sectional area which are operable at higher current densities to achieve high efficiency of conversion of electrical input to radiative output. By the choice and disposition of metallization of the stripes of one and the opposite conductivity type high optical extraction efficiency and excellent optical isolation between adjacent diodes is obtained.

3,821,617

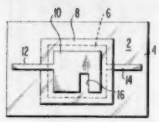
FILM TYPE CAPACITOR AND METHOD OF ADJUSTMENT

James Henry Shelby, Greenfield, and Fred Eric Richter, Indianapolis, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed June 18, 1973, Ser. No. 370,615

Int. Cl. H01g *3/26*

U.S. Cl. 317—261 **5 Claims**



An encapsulated film type capacitor which has a tail portion extending outwardly from the main body. Also a method of adjusting the capacitance value prior to encapsulation, comprising trimming off an end area of the top electrode on the tail portion.

3,821,618

ANTI-ELECTROCUTION SAFETY DEVICE FOR ELECTRICAL CONNECTORS

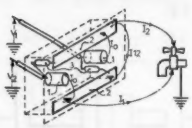
Jean-Claude Guillemain, 5 Rue Henri Rabourdin, 78, 140, Velizy, France

Filed Mar. 23, 1973, Ser. No. 344,147

Claims priority, application France, Mar. 27, 1972, 72.10593

Int. Cl. H02h *1/00*

U.S. Cl. 317—262 S **20 Claims**



To protect against injury from careless handling of live domestic electrical plugs and sockets, superficial electrodes connected to house current via concealed current limiting devices are attached to the exposed surface of the connector near the dangerous electrical terminals to provide a harmless, unpleasant electrical sensation upon reckless touching of the connector.

3,821,619

SPEED CONTROL SYSTEM FOR REVERSIBLE ELECTRICAL MACHINE

Manfred Hoffmann, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 24,218, March 31, 1970. This application July 6, 1972, Ser. No. 269,430

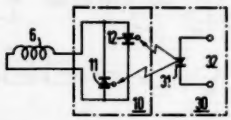
Claims priority, application Germany, Apr. 2, 1969, 1916875

Int. Cl. H02k *29/04*

U.S. Cl. 318—138 **14 Claims**

A receiver connected to the ends of the armature winding of a reversible electric machine controls the closing of the circuit

of the armature winding and therefore controls the armature current flowing through the armature winding. The receiver has a controllable circuit component having a current conducting interval determined by the position of the armature winding relative to the magnetic field of the excitation winding. The current conducting interval determines the rotary speed of the machine. A transmitter galvanically separated from the receiver provides control signals for controlling the current conducting condition of the controllable circuit component of the receiver thereby controlling the rotary speed of the machine.



3,821,620

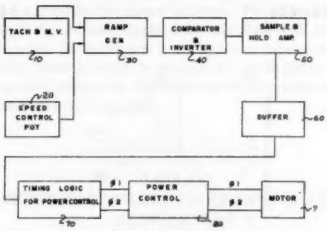
ELECTRIC INDUCTION MOTOR AND CONTROL SYSTEM

Allan W. Lindberg, Kirkwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 15, 1972, Ser. No. 253,189

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 **46 Claims**



A two phase electric induction motor including a rotary phase converter for providing the second phase of power, a fan on the shaft of the rotary phase converter for cooling the motor independent of the shaft speed of the motor, and a speed control powered by the output of the rotary phase converter for controlling the firing angles of triacs in series with the first and second windings of the motor. The speed of the motor is sensed by an electronic tachometer including a pair of induction coils which are electrically coupled to each other across an air gap to form a variable feedback system for a tuned high frequency amplifier. A circuit board disc carried by the motor shaft includes 36 peripheral copper plates which, as they pass through the air gap between the inductors, disturb the coupling between the inductors and produce an output envelope of high frequency AC. The speed control produces a ramp voltage having a slope dependent on a speed control setting and a duration which extends until cut off by a signal from the speed sensor. The ramp voltage is compared with a reference voltage, the excess voltage is converted to a DC level, buffered and fed to a timing logic circuit which increases or decreases the firing angle of the control triacs in accordance with the magnitude and sign of the error signal. The motor system is capable of exerting full torque at virtually any shaft speed, will maintain its shaft speed regardless of changes in shaft load, and will withstand extended service in a locked rotor condition. Other forms of tachometers utilizing a speed sensitive shutter positioned between a light source and a light sensing electronic component, and other speed control systems are also disclosed.

3,821,621

SAFETY BELT REGULATING APPARATUS

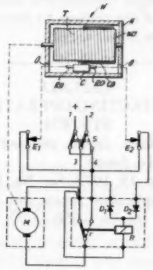
Rolf Ade, and Werner Gakenholz, both of Bietigheim, Germany, assignors to SWF Spezialfabrik Fur Antozubehor Gustav Rau GmbH, Bietigheim, Germany

Filed Mar. 28, 1973, Ser. No. 345,777

Claims priority, application Germany, Apr. 7, 1972, 2216726

Int. Cl. H02p *3/12*

U.S. Cl. 318—261 **11 Claims**



A motor which responds to operation of a switch drives a winch which winds or feeds a cable that loosens or tightens a safety belt about the passenger of a vehicle. The cable feeds and winds between two limit positions. A control, connected in series with the motor and having a control element, energizes or deenergizes the motor on the basis of signals at the control element. The switch is a polarity reverser in series with the motor and the control. The reverser applies current to the motor in one or the other direction when the control energizes the motor. A first diode couples the polarity reverser to the control element to apply a signal of one polarity to the control element when the reverser applies a current in one direction. A second diode applies a signal of the other polarity to the control element when the reverser applies current in the other direction. Limit switches which respond to the cable being in either of the limit positions disable the control and deenergize the motor. According to one embodiment the control element is a relay coil and the control is its relay contact. According to another embodiment, a switch responds to the tautness of the cable and causes the control to deenergize the cable when the cable is slack.

3,821,622

MOTOR CONTROL CIRCUIT FOR DUAL SPEED MAGNETICALLY STRIPED CARDS

Eugene V. Mateja, Norridge, Ill., assignor to Bell & Howell Co., Chicago, Ill.

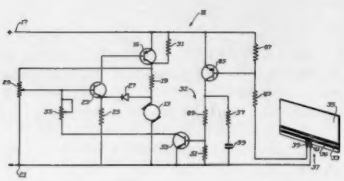
Filed Sept. 13, 1972, Ser. No. 288,619

Int. Cl. G11b *5/80;* **G06k** *7/06;* **H02p** *7/06*

U.S. Cl. 318—305 **4 Claims**

A control circuit for a motor which drives a card carrying a magnetic recording of an audio presentation. The card additionally carries a speed control signal in the form of a continuous, conductive, control stripe. The presence of the control stripe is sensed by a pair of conductive feelers switching on a transistor which controls the operative speed of the card drive

motor. The circuit additionally includes a resistor-capacitor timing circuit which prevents turn-off of the switching



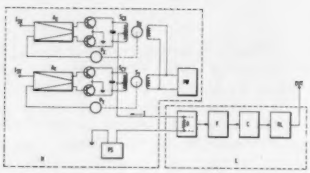
transistor in the event of intermittent interruption in the conductive path between the sensors to prevent momentary, undesired changes in the motor speed.

3,821,623

MEANS FOR DETECTING OPERATION OF SERVO-SYSTEM

Masafumi Inuiya, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 19, 1973, Ser. No. 324,904
Claims priority, application Japan, Jan. 20, 1972, 47-7881
Int. Cl. G05b *23/02*
U.S. Cl. 318—490 **7 Claims**



Increase and descrease of the current flowing through a field coil of a servomotor is detected, and the signal of the detection is used as an output for indicating whether the servosystem is in operation or not.

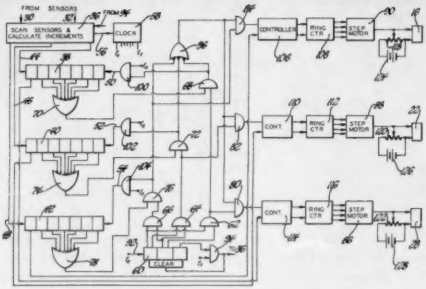
3,821,624

CONTROL SYSTEM INCORPORATING PLURAL INCREMENTAL DRIVE UNITS

Rene M. Iadipaolo, Southfield, and William B. Jones, Huntington Woods, both of Mich., assignors to Tested Electronic Computer Hardwares and Softwares, Inc., Livonia, Mich.

Filed June 29, 1972, Ser. No. 267,339
Int. Cl. G05b *23/02*
U.S. Cl. 318—603 **14 Claims**

The operation of a process is automatically regulated by a computer which receives the outputs of sensors connected to measure various parameters of the process, and generates control signals to modify the state of certain process variables. The variables are controlled through electrical signals generated by potentiometers driven by stepping motors. Based on its inputs the computer calculates desired changes in the settings of the various potentiometers in terms of increments of the stepping motor drives. These motion increments for each of the stepping motors are stored in memory sections associated with the steppers. At a particular point in the computer cycle the memory sections are sequentially scanned, an output pulse is provided to a particular stepper if its contents



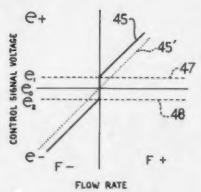
are non-zero and the contents of a particular memory section are decremented by one unit. This process is repeated at regular intervals in the cycle of operation of the system.

3,821,625

CONTROL CIRCUIT WITH DEADBAND COMPENSATION FOR ELECTRICALLY ACTUATED DEVICES

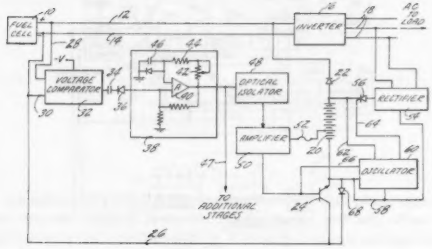
Rolland D. Scholl, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 18, 1972, Ser. No. 289,938
Int. Cl. G05b *5/01*
U.S. Cl. 318—624 **5 Claims**



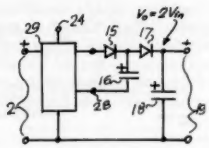
A device, such as an electrical motor or an electrohydraulic valve controlling a fluid motor, which initiates movement of a load in response to electrical energization and which exhibits a significant deadband wherein load movement is not initiated until the applied energization rises to a sizable magnitude is provided with a control circuit which can effectively eliminate the deadband, thereby increasing sensitivity of response to control signals. The control signal is transmitted to the device through a first amplifier having an output which varies in accordance with the input signal whereby the rate of load motion is a function of control signal magnitude. To eliminate the deadband, a second amplifier is also connected between the device and the control signal source. The second amplifier has very high gain and an output signal magnitude limited to that needed to compensate for deadband in the device. Thus a control signal of any magnitude, including very small magnitudes, immediately applies energization to the device which compensates for the deadband thereof. The invention is applicable to both open loop systems wherein the control signal is produced by manually operated means, for example, and also to closed loop or servo systems. Deadband may be desirable in some open loop systems and the invention provides for optionally restoring deadband where it is preferable.

3,821,626
BATTERY PEAKING UNIT FOR FUEL CELL POWER PLANTS
William J. Maver, Canton, Conn., and David E. Rosati, Springfield, Mass., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed June 18, 1973, Ser. No. 371,200
Int. Cl. H02j 7/00, 7/34
U.S. Cl. 320—3 10 Claims



An auxiliary storage battery or other DC rechargeable power source is connected in parallel with a fuel cell to supply additional current to a load when an overload such as the starting of a motor causes the fuel cell voltage to drop. The fuel cell voltage is sensed and when it reduces below a preselected value the auxiliary battery supplies current to the load for a preselected timed interval. The storage battery is recharged by power supplied by the fuel cell only during periods when the battery is not supplying current to the load. Excessive battery drain is prevented by shutting down the peaking unit whenever fluctuations in the fuel cell voltage cause multiple peaking cycles.

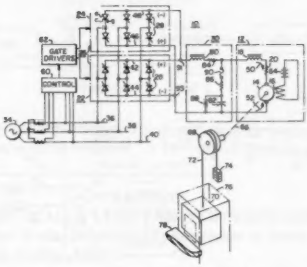
3,821,627
D-C VOLTAGE MULTIPLIERS AND POLARITY CONVERTERS
Slavko Milovancevic, P.O. Box 402, Torrance, Calif. 90508
Filed July 26, 1971, Ser. No. 166,108
Int. Cl. H02m 1/08, 3/14
U.S. Cl. 321—2 6 Claims



Circuits to perform voltage multiplication and polarity conversion function using diodes and capacitors, driven by a voltage sensing and/or an amplifier stage, for rectified non-filtered sine wave voltage as input.

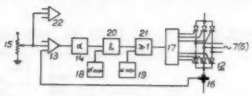
Circuits to perform voltage multiplication and polarity conversion function using diodes and capacitors driven by an astable multivibrator for battery or rectified, filtered a-c voltage as input voltage.

3,821,628
ELEVATOR SYSTEM
William R. Caputo, Wyckoff, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed May 21, 1973, Ser. No. 362,139
Int. Cl. H02m 1/12
U.S. Cl. 321—9 R 6 Claims



An elevator system including an elevator car mounted for movement in a guided path, and means including static converter apparatus connected to a source of alternating potential and to a direct current motor, for driving the elevator car in its guided path. The static converter apparatus includes an electrical filter on the direct current side thereof for reducing the magnitude of the ripple component in the direct current voltage applied to the direct current motor, to reduce the operating sound level thereof.

3,821,629
CONVERTER STATION WITH PARALLEL STATIC CONVERTERS
Gote Liss, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed June 21, 1973, Ser. No. 372,189
Claims priority, application Sweden, July 10, 1972, 9079/72
Int. Cl. H02m 1/18
U.S. Cl. 321—11 5 Claims

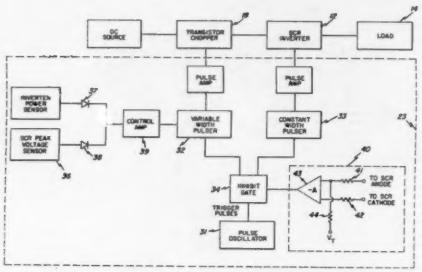


A converter station is composed of two parallel static converters each provided with a control system including a current regulator which is adjusted in accordance with a predetermined load distribution over the two converters. Each of the control systems is provided with an upper and a lower limit value emitter for the control angle. In order to equalize the load distribution between the static converters in the event of a commutation fault in one of them, current sensitive and comparing members are provided which sense the current distribution between the converters. These members emit a signal in the least loaded static converter to the lower limit value emitter in the same static converter for temporarily reducing the lower limit value for the control angle, in response to deviation from the normal current distribution exceeding a certain value.

3,821,630
COMMUTATION FAILURE DETECTION AND CONTROL FOR SCR INVERTERS

William P. Kornrumpf; John P. Walden, and Loren H. Walker, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 2, 1973, Ser. No. 384,989
Int. Cl. H02m 1/18
U.S. Cl. 321—11 9 Claims

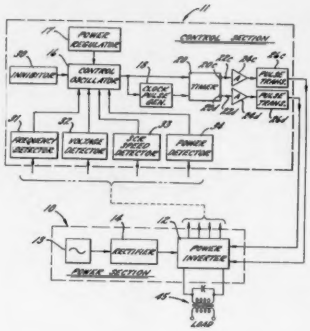


A direct current-to-alternating current inverter employing a silicon controlled rectifier (SCR) is described in which control means is provided to promptly and automatically restore inverter operation after a commutation failure. The control means includes means for sensing the instantaneous voltage across the SCR and comparing this voltage with a threshold voltage. Whenever the SCR voltage is lower than the threshold voltage, the gating pulses to the SCR and a series connected chopper of the inverter are inhibited. When the threshold voltage is exceeded, gating pulses are passed to the SCR and the chopper, thereby providing normal inverter operation.

3,821,632
HIGH FREQUENCY POWER GENERATOR

Edward J. Rylicki, Harwood Heights, Ill., assignor to Induction Heating and Engineering Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 197,191, Nov. 9, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 303,845
Int. Cl. H02m 7/52
U.S. Cl. 321—45 R 12 Claims

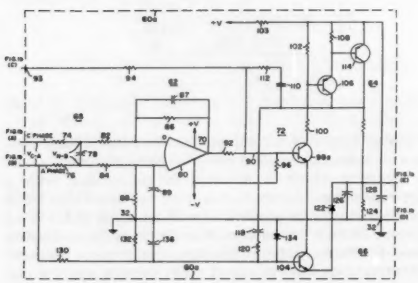


A static inverter system capable of providing ac. power at frequencies as high as 10 KHz. is characterized by an exceptionally high power factor and efficiency and employs one or more capacitive storage circuits on a time sequenced basis to cyclically and successively charge from a dc. power supply and discharge through an ac. load. The storage circuit charge via respective thyristors and the sequencing is affected by sequentially gating the thyristors with fast rise time, short duration firing pulses so that very short charging time constants may be selected without danger of damaging the thyristors or upsetting the desired sequencing.

3,821,631
CIRCUIT FOR SHIFTING THE PHASE OF A SINE WAVE BY DIFFERENTIAL MEANS

Adolf C. Betke, Greenfield, Wis., assignor to Litton Industrial Products, Inc., Milwaukee, Wis.

Filed Sept. 7, 1972, Ser. No. 286,957
Int. Cl. H02m 7/20
U.S. Cl. 321—40 8 Claims

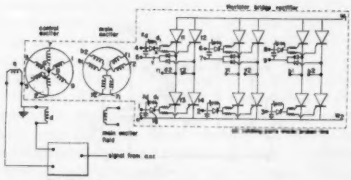


A phase-shift network and a differential amplifier shift the phase of an AC input voltage by a predetermined amount to produce a sine wave voltage which may also reference to a circuit common voltage.

3,821,633
DYNAMO-ELECTRIC MACHINES

David Lynn Neasham, and William Frederick Wright, both of Newcastle upon Tyne, England, assignors to Reyrolle Parsons Limited, Durham, England

Filed Oct. 25, 1972, Ser. No. 300,646
Claims priority, application Great Britain, Oct. 25, 1971, 49554/71
Int. Cl. H02p 9/30
U.S. Cl. 322—73 11 Claims

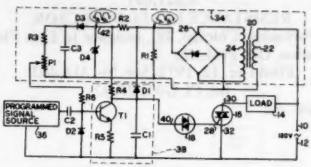


A direct current excitation system for a rotating winding of a dynamo-electric machine, for example the field winding of a turbogenerator, employs a rotating rectifier bridge arrangement in which semi-conductor controlled rectifiers are provided together with firing initiation means for the rectifiers, the system enabling reliable firing control of the rectifiers to be simply achieved without the need for transfer of firing pulses from static to rotating machine elements.

3,821,634
EXTERNALLY REGULATED POWER PHASE CONTROL CIRCUIT

Dabravko F. Sabolic, Akron, Ohio, assignor to Tony Construction, Inc., County of Summit, Ohio

Filed Oct. 2, 1972, Ser. No. 294,477
Int. Cl. G05f *1/44*
U.S. Cl. 323—24 **2 Claims**

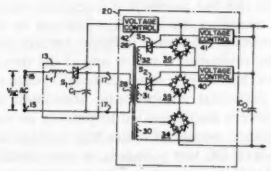


An electrical circuit is disclosed whereby power phase control may be uniquely achieved in correlation with any of numerous external control sources. A timing circuit is utilized in conjunction with a diac-triac power control circuit to achieve the desired regulation. An external programmed signal source provides predetermined signals to achieve control of the timing circuit. Consequently, the external programmed signal source directly affects the degree of power regulation of the diac-triac control circuit.

3,821,635
CAPACITOR CHARGING CIRCUIT

Donald S. Kimmel, Monroeville, and Derek A. Paice, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1972, Ser. No. 302,941
Int. Cl. G05f *1/68*
U.S. Cl. 323—102 **10 Claims**



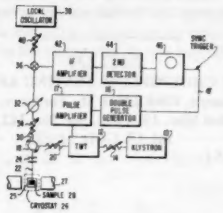
A capacitor is repetitively charged and discharged for use in flash tube apparatus, or the like. An AC supply is utilized and current from the AC supply is maintained substantially constant while the charging current is made to vary with time to achieve a substantially constant power charge rate while maintaining a nearly unity power factor on the AC supply.

3,821,636
GENERATION OF REPETITIVE SPIN ECHOES IN RUTILE

Donald A. Bozanic; Dickron Mergerian, both of Baltimore, and Ronald W. Minarik, Lutherville, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 45,101, June 9, 1970, abandoned. This application Mar. 20, 1972, Ser. No. 236,224
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 R **3 Claims**

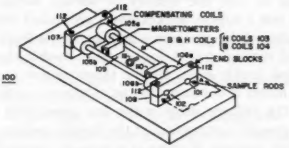
A system for the generation of a plurality of equally spaced repetitive spin-echo signals from an RF "input" pulse and an RF "recall" pulse utilizing a sample of titanium dioxide (rutile) preferably having an irregular shape and being doped with iron group transition group ions to produce paramagnetic defect centers in the order of 1×10^{16} defect centers/cm^3.



3,821,637
AUTOMATICALLY COMPENSATED PERMEAMETER

Carl Gunnar Svala, Delaware, Ohio, assignor to North Electric Company, Galion, Ohio

Continuation-in-part of Ser. No. 248,175, April 27, 1972, abandoned. This application Apr. 23, 1973, Ser. No. 353,418
Int. Cl. G01r *33/14*
U.S. Cl. 324—34 PE **27 Claims**

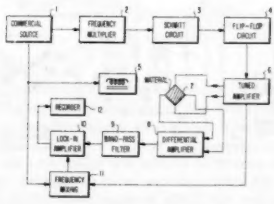


A permeameter for testing a rod sample of a material wherein magnetizing flux and compensation coils are wound around a rod sample of the material, and magnetometers are provided for automatic detection and compensation of magnetic potential difference.

3,821,638
HALL EFFECT MEASURING APPARATUS

Shunsuke Kobayashi, and Takuji Kaneda, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 16, 1973, Ser. No. 342,244
Claims priority, application Japan, Mar. 18, 1972, 47-27943
Int. Cl. G01r *33/06*
U.S. Cl. 324—45 **8 Claims**



In the A.C. method of measuring the Hall effect, an identical source is used for both of the bias current source and the

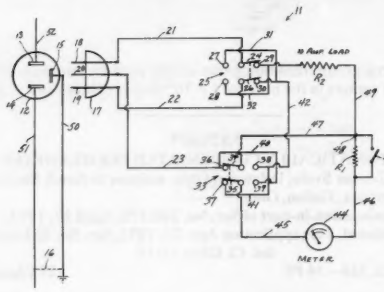
alternating magnetic field source so that the bias current and the magnetic field produced are phase-locked. The Hall voltage generated is detected by, e.g., a synchronous rectifier, e.g., a lock-in amplifier, using the reference signal obtained from the above source if the Hall voltage generated is low.

3,821,639

SOCKET GROUND LINE TESTING APPARATUS

Philip A. De Langis, 4060 226th St., Torrance, Calif. 90505

Filed Mar. 19, 1973, Ser. No. 342,403
Int. Cl. G01r 31/02
U.S. Cl. 324—51 **5 Claims**



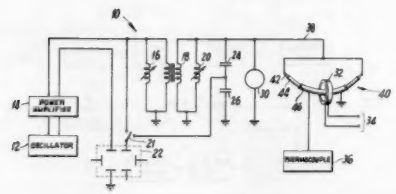
Apparatus to test the quality of socket wiring, namely, whether or not a supply socket has a grounded line terminal and the quality of the grounding connection. A load resistance is connected through a first double-pole, double-throw switch and a second double-pole, double throw switch to a 3-prong plug, and a meter is connected so as to measure either the line voltage or the voltage drop in the line grounding system. If there is no ground connection at the supply socket, the meter reads the line voltage. If there is a ground connection at the supply socket, the meter will give a relatively low reading, namely, the voltage drop in the line grounding system, in one switching configuration, and will give the line voltage in another switching configuration.

3,821,640

METHOD AND APPARATUS FOR ACCELERATED TESTING OF POWER CABLE INSULATION FOR SUSCEPTIBILITY TO TREEING

George Bahder, Suffern, and Carlos Katz, Spring Valley, both of N.Y., assignors to Phelps Dodge Industries, Inc., New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,380
Int. Cl. G01r 31/12
U.S. Cl. 324—54 **27 Claims**



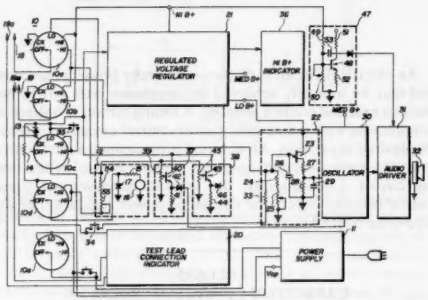
Extruded power cable insulation is tested for susceptibility to gradual electro-chemical deterioration (electro-chemical treeing) by wetting at least a portion of the insulation of a sample of the cable with a selected liquid wetting agent and applying a high frequency, high voltage alternating current signal across the wetted portion of the insulation. During testing the conductor of the test sample may be heated to approximately its normal operating temperature. The cable sample may also be mechanically stressed during the test if desired. Trees develop in considerably less time than is required under normal operating conditions.

3,821,641

RESISTANCE LEVEL DETECTOR

Peter G. Portoulas, Chicago, Ill., assignor to Ecos Electronics Corporation, Oak Park, Ill.

Filed Dec. 12, 1972, Ser. No. 314,403
Int. Cl. G01r 27/02
U.S. Cl. 324—62 **9 Claims**



A portable resistance level detector for determining the unknown resistance between a pair of test points under high voltage and low voltage test conditions is disclosed. More particularly, the detector includes a switching arrangement for selectively coupling regulated high-level and low-level DC potentials across the test points and a resistive threshold arrangement for sampling the resultant current to determine whether the unknown resistance is below certain preselected thresholds. If the resistance is below any of the thresholds set for high-level and low-level testing, an audio system is enabled to generate a particular audible tone associated with each threshold. A meter is also provided to provide an exact readout of the resistance measured under high voltage test conditions. The high-level DC test voltage is, in turn, developed by a novel regulated voltage generator. The generator includes circuitry for developing a pulse train at a rate determined by the charging and discharging time constants of a capacitive element included in a control circuit. The pulses are subsequently rectified and filtered to provide a DC potential. A feedback network monitors the DC output potential to vary the charging time constant and hence the rate at which pulses are applied to the rectification network. In this manner, the DC potential is maintained at a constant level regardless of load conditions.

3,821,642

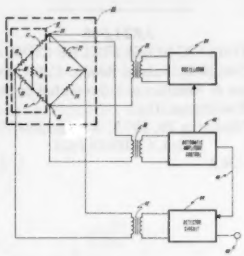
CORROSION MEASURING BRIDGE CIRCUIT HAVING AUTOMATIC CONTROLLED CONSTANT SOURCE OF ENERGY AND TEMPERATURE COMPENSATION

Edgar Wilson Seymour, Freeville, N.Y., assignor to Ithaco Inc., Ithaca, N.Y.

Filed Nov. 30, 1972, Ser. No. 310,844
Int. Cl. G01r 27/02
U.S. Cl. 324—65 CR **10 Claims**

A controllable source of alternating current signals, for excitation of a bridge circuit used in apparatus such as corrosion

analyzers and the like, includes an automatic amplitude control circuit to maintain the amplitude of the alternating current signals applied to the bridge circuit substantially constant for wide variations in the impedance of the bridge circuit. By



maintaining the bridge circuit excitation substantially constant, the amplitude of the bridge circuit unbalance signals now provides an accurate indication bridge circuit unbalance and therefor the corrosion of a probe element connected in the bridge circuit.

3,821,643

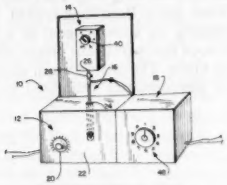
BLOOD COAGULATION TIMER

William Derry Bostick, and Peter William Carr, both of Athens, Ga., assignors to Research Corporation, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,278

Int. Cl. G01r *27/02*

U.S. Cl. 324—65 R **4 Claims**



The clotting time of blood is determined at the instant of the initiation of clotting by detecting the sharp change in electrical resistance of a resistive circuit component having a large negative or positive temperature coefficient of resistance, immersed in the blood. The clotting time may be indicated visually, or audibly, or a time-temperature reading may be continuously recorded on a strip chart or the like or a combination of such indicators may be used.

3,821,644

DEVICE FOR AUTOMATIC COUNTING AND MEASUREMENT OF SUSPENDED PARTICLES

Hildegard Gohde, both of Post Box 3244, Munster, and Wolfgang Godhe, both of Munster, Germany

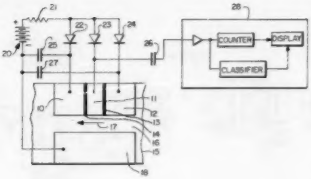
Filed Mar. 19, 1973, Ser. No. 342,494

Claims priority, application Germany, Apr. 26, 1971, 2120342

Int. Cl. G01m *27/00*

U.S. Cl. 324—71 CP **6 Claims**

A particle detecting apparatus includes a gap defined between two electrodes at least one of which constitutes three plates of electrically conductive material separated from each other by electrically nonconductive material, the two electrodes being supported in an electrically nonconductive mounting. The opening thus formed is of capillary dimensions. The electrodes are connected to circuit means which impose a potential between the electrodes, subjecting the intervening space to an electric field. The dielectric characteristics in the gap are altered as a dispersion of particles is passed therethrough, the dielectric changes being detected by the circuits connected to the electrodes. In one embodiment, capaci-



tors connect the outer two electrodes to ground and the center electrode to a measuring device. In another embodiment, each side has three electrodes and the center electrodes constitute the frequency determining elements of an oscillator. In each case the three plates forming the electrode have substantially flat, parallel faces perpendicular to the direction of flow of the particle suspension.

3,821,645

DEVICE FOR TESTING THE OPERATION OF SEQUENTIAL INTEGRATED CIRCUITAL UNITS

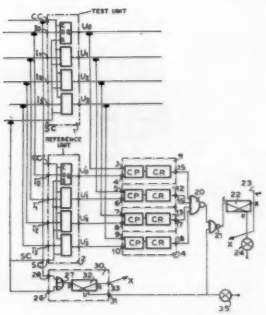
Mario Vinsani, Milan, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Mar. 13, 1973, Ser. No. 340,798

Claims priority, application Italy, Mar. 17, 1972, 21989/72

Int. Cl. G01r *15/12*

U.S. Cl. 324—73 R **5 Claims**



A device is provided for testing integrated circuit units, the device including means for connecting the unit under test and comparing the outgoing signal of the unit with the outgoing signal of a reference unit to detect a difference in the logic operation of the unit under test and to determine failures. In order for such comparison to be accomplished, the reference unit is placed in the same state in which the unit under test should be for correct operation. The present device is advantageously employed in testing those units having circuit elements capable of assuring one of two definite states, and remaining in that state for an indefinite length of time.

3,821,646

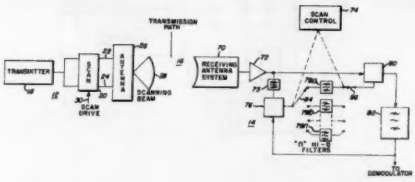
SCATTER COMMUNICATION SYSTEM

William J. Bickford, Weston; Howard J. Rowland, Newton Highlands, and Carson K. H. Tsao, Braintree, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 812,807, April 2, 1969, abandoned. This application Feb. 25, 1972, Ser. No. 229,577

Int. Cl. H04b 7/02

U.S. Cl. 325—56 2 Claims



A scatter communication system which utilizes a scattering medium whose time variations of index of refraction within the medium are random and slow compared to the characteristic times of the radiation and the propagation time. The system is designed to provide a means of eliminating the deep fading from the mean value of signal strength encountered in a tropospheric and ionospheric scatter communication systems. By very rapidly scanning the transmitting antenna beam at a rate at least equal to twice the highest information frequency on the carrier, short term fading on the order of less than one minute is eliminated.

3,821,647

RADIO RECEIVING MEANS

John L. Minasian, 2319 W. Magnolia Blvd., Burbank, Calif. 91506

Continuation-in-part of Ser. No. 148,465, June 1, 1971, abandoned. This application Feb. 6, 1973, Ser. No. 330,024

Int. Cl. H04b 1/08

U.S. Cl. 325—356 8 Claims

Radio receiving means involving an earpiece assembly which incorporates a transducer for conforming electronic signals into audio energy and which also incorporates a conductive ring for making good conductive connection to the person's ear so that the user himself may serve as an antenna depending upon prevailing radio reception conditions.

The earpiece assembly also incorporates a small casing in which a diode is mounted, the diode, transducer and conductive ring being interconnected to a pair of receiving terminals, one of which may be an elongated wire terminating in a clip for releasably fastening to an insulated or metallic element. The diode and transducer are connected in parallel in the simplest form. In some instances an additional diode may be used with the diodes being connected in series with each other and in parallel with the transducer with the diodes being so poled to obtain a circulating current through the transducer. In other modifications, a capacitor may be incorporated either in series with the diode or in series with the transducer for some frequency activity.

3,821,648

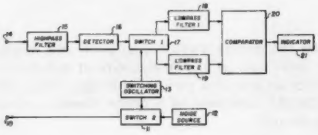
AUTOMATIC NOISE FIGURE INDICATOR

Kenneth J. Campbell, Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1973, Ser. No. 364,778

Int. Cl. H04b 1/00

U.S. Cl. 325—363 6 Claims



An automatic noise figure indicating system impresses noise of known amplitude on the RF input of a receiver under test and uses the audio output of the receiver to measure its noise figure. The injected noise is cyclically impressed upon the receiver at a determinable switching frequency, the output of the receiver being alternately connected to first and second low-pass filters in synchronism with the switching. A high-pass filter suppresses the switching frequency and prevents its detection in the noise figure indicating system. A means is provided for developing an analog signal as a function of the power ratio between the two signals produced by the first and second low-pass filters. The analog signal is visually presented by an indicator appropriately calibrated in terms of noise figure.

3,821,649

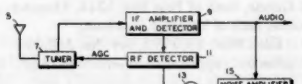
SIGNAL STRENGTh METER CIRCUITRY

Jon Paul Grosjean, Obereschach, Germany, assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Feb. 15, 1973, Ser. No. 332,635

Int. Cl. H04b 1/16

U.S. Cl. 325—398 11 Claims



A signal receiver having connected IF amplifier and detector stages includes a signal strength meter circuit wherein a fixed potential provides a given meter deflection, IF signals derived from received signals above a given level increase the

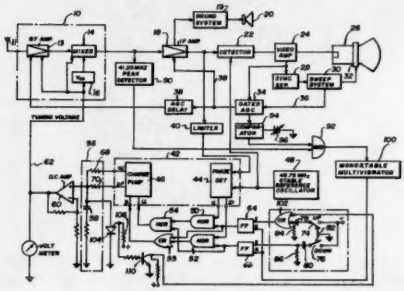
meter deflection, and detected signals representative of noise derived from received signals below a given level decrease the meter deflection whereby the range of meter deflection representing signal strength variations is increased.

3,821,650

PHASE LOCK LOOP ELECTRONIC TUNING SYSTEM

Kiyoshi Kase, Tokyo, and Shikun Kyu, Yokohama, both of Japan, assignors to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 26, 1973, Ser. No. 326,845
Int. Cl. H04b *1/16*
U.S. Cl. 325—423 **8 Claims**



A superheterodyne television receiver is disclosed with a phase lock loop tuning system for providing completely electronic and automatic tuning of the receiver. The voltage controlled oscillator of the tuner is controlled by a tuning voltage obtained from a phase detector responsive to the video carrier frequency at the IF amplifier output and a reference frequency obtained from a stable reference oscillator. Provision is made for breaking the loop when it is desired to change channels to force the tuning voltage to be selectively driven upward or downward until the next channel is reached whereupon the system resets automatically. The phase lock loop from the IF amplifier output then once again is resumed to maintain tuning to the newly selected channel.

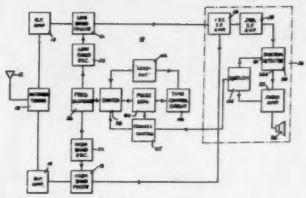
3,821,651

SCANNING CONTROL CIRCUIT FOR USE IN SIGNAL-SEEKING RADIO RECEIVER

George H. Fathauer, Decatur, Ill., and Cecil E. Mathis, Indianapolis, Ind., assignors to Masco Corporation, Cumberland, Ind.

Filed Nov. 2, 1972, Ser. No. 303,010
Int. Cl. H04b *1/32*
U.S. Cl. 325—470 **19 Claims**

For use in a signal-seeking radio receiver for automatically and sequentially tuning to a plurality of predetermined radio frequencies, the receiver including means for reproducing the intelligence in radio frequency signals received at said predetermined frequencies, the combination comprising local oscillator means for generating a plurality of different local oscillator signals and a switching circuit for automatically and sequentially activating predetermined portions of the local oscillator means thereby sequentially and repetitively to generate the aforementioned plurality of local oscillator signals individually and in a predetermined sequence. A pulse generator is provided for sequencing the switch means at a first predetermined stepping rate thereby to tune the receiver to receive radio frequency signals for a first predetermined time period at each of said frequencies in sequence. The receiver further includes means for holding said receiver tuned to individual ones of said predetermined radio frequencies in response to reception of a radio frequency signal



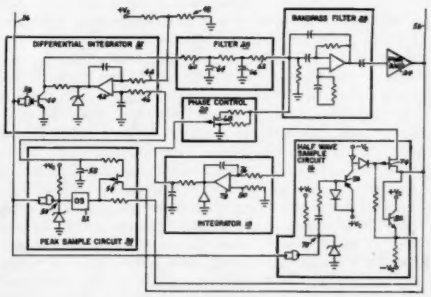
thereat after a predetermined delay period shorter than said first predetermined period. The switching circuit further includes means for increasing the stepping rate of the pulse generator in synchronism with tuning of said receiver to selected ones of said radio frequencies to thereby reduce said first predetermined period to a period less than said delay period, whereby the receiver cannot "lock" onto the selected frequencies.

3,821,652

SQUARE TO SINE CONVERTER

Harold Wiebe, Sharonville, and Robert G. Wise, Loveland, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 14, 1972, Ser. No. 280,725
Int. Cl. H03k *5/08*
U.S. Cl. 328—27 **9 Claims**

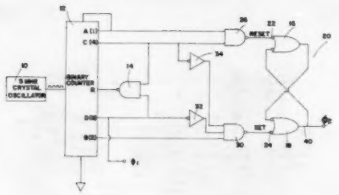


An apparatus is disclosed for converting a square wave signal to a sine wave signal wherein said sine wave signal maintains a fixed predetermined phase relation to the square wave signal. A feedback circuit is provided which samples the sine wave signal as a function of the square wave signal and produces a correction signal representing the phase relation therebetween. A sine wave generator is responsive to the square wave signal and the correction signal for producing the sine wave signal in a fixed predetermined phase relation to the square wave signal.

3,821,653
COMPUTER CLOCK FOR MEMORY MODULE

Charles C. Fretwell, Worthington, Ohio, assignor to MI2, Incorporated, Columbus, Ohio

Filed July 16, 1973, Ser. No. 379,800
Int. Cl. H03k 1/00, 3/04
U.S. Cl. 328—62 7 Claims

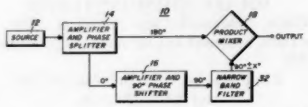


A computer clock for generating a pair of separate, related computer clock signals. The clock utilizes a precision crystal oscillator, binary counter and logic circuitry for generating the desired clock signals and features a reduction in the number of required logic gates below the conventional requirements.

3,821,654
WIDEBAND DISCRIMINATOR CIRCUIT WITH IMPROVED OPERATING CHARACTERISTICS

Peter H. Van Anrooy, Itasca, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 20, 1973, Ser. No. 333,575
Int. Cl. H03d 3/18
U.S. Cl. 329—103 10 Claims



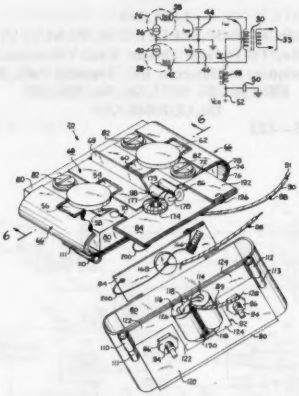
A wideband frequency discriminator arrangement with extended pull-in range is disclosed, which is especially suited for application in automatic fine tuning systems of television receivers. The discriminator circuit is in integrated circuit form and is of a balanced type arrangement to effectively cancel out or neutralize any spurious signal information or other unwanted distortion components. The circuit arrangement includes respective input terminals for receiving derived push-pull television signals, which are then amplified and applied to respective synchronous switches. The amplified signal is also applied further to one of a pair of transistor amplifiers having an inductive reactance interconnecting their emitter circuits and an additional tuned circuit interconnecting their collector circuits. Accordingly, any deviation from the precise desired frequency results in a difference in phase which when applied to the synchronous switches effects an output with a d-c component which may be utilized for controlling the appropriate portion of the receiver, such as the voltage controlled local oscillator in the tuner mechanism.

3,821,655
HIGH-FREQUENCY AMPLIFIER

Alan J. Fisher, Huntsville, Ala., assignor to SCP Systems, Inc., Huntsville, Ala.

Filed Aug. 24, 1970, Ser. No. 66,392
Int. Cl. H03f 3/26
U.S. Cl. 330—15 18 Claims

A high-frequency amplifier intended for use primarily in radio transmitters, and particularly in transmitters used in aircraft. The circuit preferably is a push-pull circuit utilizing a pair of power transistors. A capacitor is connected between the emitter and collector leads of each transistor. The capacitance of the capacitor has a value such that the capacitor and the output inductance of the transistor together form a resonant circuit whose center frequency coincides with the

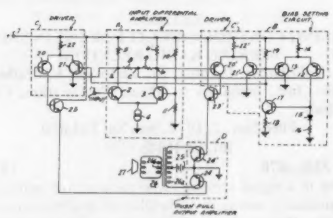


center frequency of the band of the second harmonic signals produced by the amplifier, thus effectively minimizing second harmonic voltages in the transistors. Preferably, the capacitors are formed by parallel-plate transmission lines which also are used to interconnect the electrodes of the transistors, and to form input and output leads of the circuit. The parallel-plate transmission lines have very low inductances; their use minimizes the lead inductances of the amplifier. An output transformer is provided which performs the function both of an output transformer and a radio-frequency choke.

3,821,656
TRANSISTOR CIRCUIT FOR THE DRIVER STAGE OF A CLASS B AMPLIFIER

Masashi Takeda, Isehara, and Masafumi Kikuchi, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 3, 1972, Ser. No. 294,617
Claims priority, application Japan, Oct. 12, 1971, 46-80432; Oct. 12, 1971, 46-80433
Int. Cl. H03f 3/26
U.S. Cl. 330—15 5 Claims



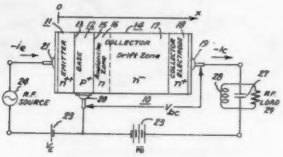
A differential amplifier employing a pair of transistors whose bases are biased differentially with respect to each other so that when used for a driver in a class B amplifier a dynamic range is obtained which is approximately twice the width of prior art differential amplifiers.

3,821,657

HIGH FREQUENCY SEMICONDUCTOR AMPLIFYING DEVICES AND CIRCUITS THEREFOR

Se Puan Yu, and Wirojana Tantraporn, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 25, 1972, Ser. No. 300,481
Int. Cl. H03f 3/14
U.S. Cl. 330—39 18 Claims



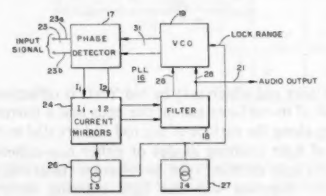
A three terminal semiconductor device for providing power amplification at microwave frequencies includes emitter, base and collector regions. The collector region includes a drift zone for majority carriers generated therein adjacent the collector P-N junction by avalanche multiplication. The operating bias voltage of the collector region in relation to the base region is set so that the collector region is depleted of majority carriers and electric field intensity is produced adjacent the collector P-N junction which is less than that required to produce avalanche multiplication of conduction carriers over the collector region and current flow therein without limit. Signal current applied in circuit between the emitter and base regions produces a flow of majority conduction carriers into the collector region where they are multiplied by avalanche multiplication action. The avalanche generated charge acted upon by the electric field produced by the operating bias voltage is caused to traverse the drift zone and deliver power to an external load in circuit with the collector P-N junction. For avalanche multiplication to occur in the collector region in the preferred mode of operation of the device the semiconductor material thereof must be a material in which the avalanche coefficient of majority carriers therein is substantially greater than the avalanche coefficient of minority carriers therein.

3,821,658

PHASE LOCKED LOOP WITH MEMORY

Werner H. Hoeft, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Apr. 26, 1973, Ser. No. 354,531
Int. Cl. H03b 3/04
U.S. Cl. 331—8 3 Claims



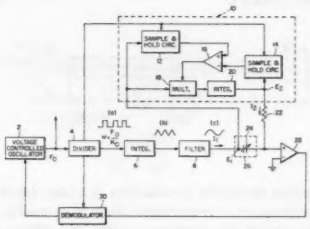
An integrated circuit phase locked loop which includes a low pass filter for preventing carrier dropout which has a long time constant. Such time constant is provided by current mirrors connected to the phase comparator of the phase locked loop which effectively drop the full supply voltage in the form of complementary error currents across relatively high impedance resistors.

3,821,659

CAPACITANCE TO FREQUENCY TRANSDUCER

Carl H. Ludwig, Roseland, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 28, 1973, Ser. No. 345,616
Int. Cl. H03b 3/04
U.S. Cl. 331—65 7 Claims



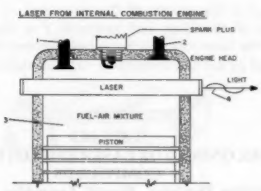
A capacitance to frequency transducer wherein an alternating signal is filtered and then phase shifted. The filtered signal is applied through a variable capacitor and summed with the phase shifted signal applied through a stable resistor to provide an error signal. The error signal changes the frequency of the alternating signal as a function of capacitance to provide a balancing effect.

3,821,660

APPARATUS FOR IRRADIATION OF LASER CAVITY

Jer-Yu Shang, Wilmington, Del., and William B. Hansel, Media, Pa., assignors to Sun Research and Development Co., Philadelphia, Pa.

Continuation-in-part of Ser. No. 3,964, Jan. 19, 1970, abandoned. This application June 12, 1972, Ser. No. 261,764
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 8 Claims



A system for the irradiation of a target with electromagnetic energies covering the region between approximately the infra-X-ray and the trans-infrared portions of the spectrum comprises: light associated with a shock wave front aligned to strike a tape valve comprising a movable tape, impervious to said shock wave, having a mirror-like surface and also at least one aperture in spaced relation to said surface and means for moving said tape at a speed such that said light strikes the mirror-like surface and said shock wave front passes through said aperture; a shock sensitive irradiable target optically coupled to said mirror-like surface and said movable member, whereby to provide via said movable member a light-coupling between said target and light source.

3,821,661
RESONATOR DEVICE FOR THE PRODUCTION OF LASER BEAMS

Jurg Steffen, Kehrsatz, and Hans-Peter Lortscher, Thun, both of Switzerland, assignors to Pierres Holding S[illegible], Biel, Switzerland

Filed Sept. 22, 1972, Ser. No. 291,825

Claims priority, application Switzerland, Sept. 23, 1971, 13934/71

Int. Cl. H01s *3/00*

U.S. Cl. 331—94.5 C **23 Claims**

A resonator device for production of a laser beam comprising two mirrors and a rod-shaped amplifying medium adapted for being excited by pumping means and which is located between the two mirrors, wherein the stability condition $0<g_1 \cdot g_2<1$ is satisfied for the resonator parameters g_1 and g_2 and wherein these parameters correspond to the equations:

$$g_1=\zeta-L/\rho_1-b/f$$

$$g_2=\zeta-L/\rho_1-a/f$$

and that the parameters are located in a rectangular coordinate system with g_1 and g_2 as axes in a region which is limited by two curves which correspond to the equation:

$$\pm 0.2fL(1-g_1 g_2)=(2g_2-1/g_1)\,[b(d/n+b\zeta)+d/2_n\zeta(b^2/f+d/n)]$$

$$+1/g_2[a(d/n+a\zeta)+d/2_n\zeta(a^2/f+d/n)]+2ab+d/n\,(a+b)/\zeta$$

wherein one of the curves has the positive sign, the other one has negative sign, and wherein the quantities relate to:

$$g_1=\zeta-L/\rho_1-b/f$$

$$g_2=\zeta-L/\rho_2-a/f$$

$$\zeta=(1-d/nf)\tfrac{1}{2}$$

$$L=\zeta(a+b)+d/n-a\cdot b/f$$

wherein: d is the length of the laser rod, n is the index of refraction of the laser rod material, f is the thermal focal length of the laser rod which has been heated by the pumping, and ρ_1 and ρ_2 are the respective radii of curvature of the two mirrors.

3,821,662
SEMICONDUCTOR LASER EMPLOYING III-VI COMPOUNDS

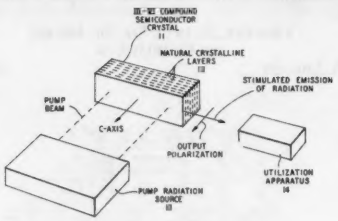
John Christian Dewinter, Howell Township; Robert Francis Leheny, Little Silver; Robert Edward Nahory, Lincroft; Jagdeep Chandravadan Shah, Matawan, and Kerry Lee Shaklee, Laurence Harbor, all of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 123,680, March 12, 1971, abandoned. This application Nov. 2, 1972, Ser. No. 303,140

Int. Cl. H01s *3/18*; H05b *33/16*

U.S. Cl. 331—94.5 H **3 Claims**

A variety of semiconductor lasers is disclosed in which III-VI semiconductive compounds are employed. Successful laser oscillation has been obtained at about 6,010 Å in gallium selenide (GaSe) by providing an optical resonator with its axis substantially parallel to the plane of the characteristic layered structure of the semiconductive compound, thereby taking advantage of the finding that the principal emission in such a compound has its electric vector orthogonal to that plane. A theoretical and experimental analysis of various mixed gallium selenide crystals, such as $GaS_xSe_{(1-x)}$ and $Ga_{(1-y)}Al_ySe$, indicates that lasers in these materials can be obtained with outputs of frequencies that span the visible spectrum and extend into the infrared.



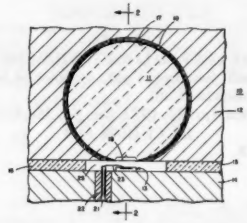
3,821,663
INTEGRAL REFLECTING CAVITY SEMICONDUCTOR PUMPED LASER

Charles H. Brenner, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 15, 1973, Ser. No. 323,480

Int. Cl. H01s *3/09*

U.S. Cl. 331—94.5 R **10 Claims**



The laser rod which may be Nd:YAG is reflectively coated over all of its surfaces except the ends and a narrow strip extending along the surface of the rod and parallel to its axis. An array of light emitting diodes of either non-coherent (spontaneous) light emitting type or coherent (laser) light emitting type are disposed with the light emitting direction being through the narrow strip. A metallic heat sink completely surrounds the sides of the laser rod except for the elongated strip, and is in good thermal conducting relation with the rod. A metallic heat sink is in good heat conducting relation with the light emitting diodes and is separated by an insulating spacer from the laser rod heat sink. The light emitting diodes are in a chamber defined by the laser rod, the heat sinks, and the insulating spacer. The chamber may or may not be filled with a clear optical cement.

3,821,664
TRAVELING WAVE EXCITED GAS LASER

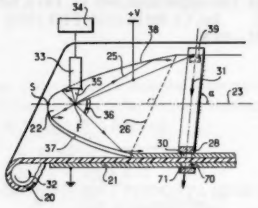
Bruno Godard, Gif Sur Yvette, and Bernard Lacour, Palaiseau, both of France, assignors to Compagnie Generale D'Electricite, Paris, France

Continuation-in-part of Ser. No. 211,374, Dec. 23, 1971, Pat. No. 3,729,689. This application Mar. 19, 1973, Ser. No. 342,350

Claims priority, application France, Mar. 17, 1972, 72.9391; Apr. 17, 1972, 72.13385; July 28, 1972, 72.27394; Nov. 9, 1972, 72.39752; Nov. 21, 1972, 72.41260; Germany, Feb. 5, 1973, 04013

Int. Cl. H01s 3/09, 3/02, 3/22

U.S. Cl. 331—94.5 R 23 Claims



A gas laser comprising an electric excitation line consisting of a sandwich of two metal plates separated by an insulating plate. The metal plates are in the form of parabolas, the focal points and the apices of the parabolas being situated on respective normals to the plane of the plates. Each metal plate has a discharge channel containing an active laser medium.

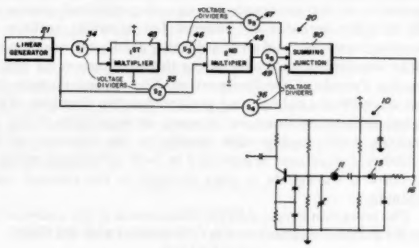
3,821,665
TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR

James S. Irwin, Ft. Lauderdale, Fla., and John R. Morton, Streamwood, Ill., assignors to Motorola, Inc., Chicago, Ill.

Filed June 11, 1973, Ser. No. 369,047

Int. Cl. H03b 5/36

U.S. Cl. 331—116 R 5 Claims



An oscillator having a frequency determining crystal connected therein which produces a frequency deviation with temperature defined by a formula including first, second and third order terms and a varactor connected to said oscillator for varying the frequency of said oscillator in response to a voltage produced by a function generating means which produces a frequency variation of the varactor that is equal to and the inverse of the frequency deviation of the oscillator so that the total effect of temperature variations on the circuit is little or no frequency deviations with ambient temperature changes.

3,821,666
MULTI-CRYSTAL OSCILLATOR FOR SELF TEMPERATURE COMPENSATION

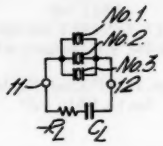
Morio Onoe, Tokyo, and Koichi Hirama, Chigasaki, both of Japan, assignors to Toyo Tsushinki Kabushiki Kaisha (also known as Toyo Communication Equipment Co., Ltd.), Kawasaki, Japan

Filed Mar. 30, 1973, Ser. No. 346,384

Claims priority, application Japan, Apr. 3, 1972, 47-33321

Int. Cl. H03b 5/32

U.S. Cl. 331—162 3 Claims



A multi-crystal oscillator for self temperature compensation comprising three parallel connected oscillator elements each having substantially parabolic frequency temperature characteristics within a predetermined compensated temperature range. The three elements being chosen to have the effective turnover temperatures in lower temperature portion, middle temperature portion and higher temperature portion. The inductances of the elements of the lower and higher temperature portions are selected to be nearly identical and that of the middle temperature portion is selected higher than that of the other portions. The frequency temperature characteristics of the oscillator is so arranged to have less degradation in the compensated temperature range when the oscillation frequency is adjusted by varying the load capacitance.

3,821,667
PROCESS AND APPARATUS FOR THE PRODUCTION OF PROPAGATING ELECTRIC ALTERNATING FIELDS

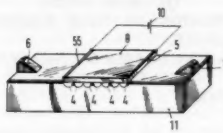
Helmut Thomann, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 24, 1973, Ser. No. 363,715

Claims priority, application Germany, June 27, 1972, 2231484

Int. Cl. H03h 9/06, 9/26, 9/30

U.S. Cl. 333—30 R 7 Claims



Propagating electric alternating fields are produced in a piezoelectric body in which an acoustic wave is coupled in by means of a transducer, the piezoelectric body having a permanently aligned surface polarization which is periodic in one region of its surface. The polarization is provided by the application of appropriate potentials to polarization electrodes in the form of interdigital electrodes which are temporarily applied to the body and subsequently removed, for example by etching. An acoustic wave having a wave length in the order of magnitude of the period of polarization of the surface polarization is coupled in and electric field components with differing phase velocities are produced in the region of the surface polarization in the space above the surface of the piezoelectric body, the phase velocity of one field component being considerably less than the phase velocity of the other

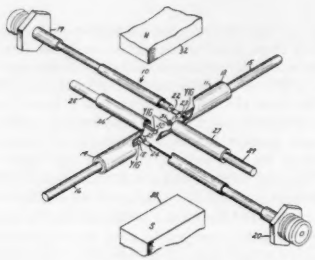
field component. In one embodiment a piezoelectric ceramic body has an electromechanical transducer which serves for output coupling of acoustic waves and a semiconductor body is provided above the surface of the piezoelectric ceramic body in the region of the periodic permanent surface polarization for purpose of amplification. In another embodiment, two piezoelectric ceramic bodies having equal, permanently aligned, periodic surface polarization and each having an electromechanical transducer, are arranged in an overlapping close proximity relationship as an adjustable time delay device.

3,821,668

ELECTRONICALLY TUNABLE MICROWAVE FILTER

Morris Cohen, Oceanside, N.Y., assignor to Loral Corporation, New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,573
Int. Cl. H01p *1/20*
U.S. Cl. 333—73 C **1 Claim**



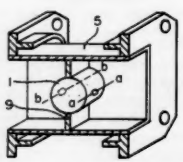
An electronically tunable "YIG" sphere filter having plural sphere coupling in combination with input and output loop couplings for the first and last spheres, the structure providing performance characteristics not obtainable with ordinary loop coupling using a single or multiple gyromagnetic spheres. These characteristics include low inserion loss, wide tunable bandwidth, and wide constant instantaneous bandwidth, making the filter particularly suitable for superheterodyne electronic countermeasure receivers using multiple octave ranges.

3,821,669

FIXED FREQUENCY SOLID DIELECTRIC FUSED QUARTZ CAVITY

Herman L. Wuerffel, c/o Naval Research Laboratory, Washington 25, D.C.

Filed Oct. 24, 1950, Ser. No. 191,910
Int. Cl. H01p *7/06*
U.S. Cl. 333—83 R **5 Claims**



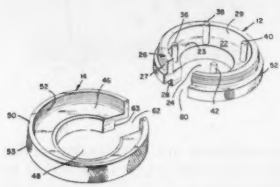
1. The combination of a hollow waveguide, a solid dielectric resonant cavity comprising a fused quartz member dimensioned to form a resonant cavity at a given frequency, the outer surface of said quartz member having a coating of a highly conductive material, said coating completely enclosing said quartz member except for a pair of openings located on opposite sides of said quartz member, means for fixedly positioning said resonant cavity in the hollow portion of said waveguide so that said openings are operative to couple electromagnetic energy in said waveguide into and out of said resonant cavity, said means including a conductive partition means bridging the gap between the conductive coating of said resonant cavity and the inner walls of said waveguide.

3,821,670

WAVEGUIDE ALIGNMENT AND QUICK DISCONNECT COUPLER

Richard M. Thompson, Fullerton, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 248,883, May 1, 1972, abandoned. This application July 11, 1973, Ser. No. 378,108
Int. Cl. H01p *1/04*; **F16l** *19/02*
U.S. Cl. 333—98 R **6 Claims**



A universal type waveguide flange aligning and quick-release assembly for coupling and decoupling abutting waveguide flanges rapidly and for providing a substantially loss free connection. The coupler which is useful for either square, substantially square or round flanges includes a first cylindrical portion having an inner flat shoulder surface or counter bored face and a threaded annular ring axially surrounding the inner shoulder surface. A plurality of dowel pins are slideably mounted in the shoulder surface in positions corresponding to the waveguide flange holes. The first cylindrical portion has an internal axial opening greater than the diameter of the shoulder structure of the waveguide flange for its attachment to the waveguide. A second cylindrical portion of the coupler includes an internal flat shoulder surface or counter bored face and an annular ring axially surrounding the inner shoulder surface and having threads thereon for engaging the threads of the first portion. The second portion also has an internal axial opening greater than the diameter of the flange supporting structure. In some arrangements of the invention, a slot having sides parallel to the diameter of the cylindrical structures is provided in both cylindrical portions to allow a waveguide to pass through to the internal axial opening.

The invention herein described was made in the course of or under a contract or subcontract thereunder with the Navy.

3,821,671

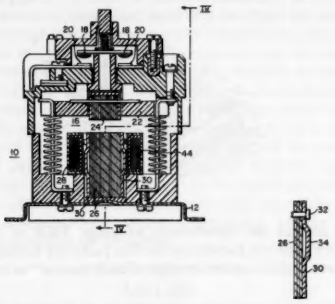
ELECTRIC CONTROL APPARATUS

Kurt A. Grunert, Beaver, and Birch L. Devault, Industry, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1973, Ser. No. 392,697
Int. Cl. H01h *45/04*
U.S. Cl. 335—132 **5 Claims**

Electric control apparatus of electromagnetic type in which the magnetic coil is encapsulated within a detachable insulat-

ing housing surrounding the magnetic core, the core and the walls of the housing adjacent the core comprising means for limiting swelling of the resinous material forming the housing when heating of the coil occurs due to an overcurrent, thereby facilitating replacement of the housing.



3,821,672

MAGNET ARRANGEMENT FOR DATA PROCESSING DEVICES

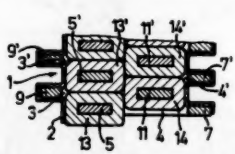
Konrad Sturm, Nurnberg, Germany, assignor to DIEHL datensysteme GmbH, Nurnburg, Germany

Filed Oct. 1, 1973, Ser. No. 402,622

Claims priority, application Germany, Oct. 3, 1972, 363123

Int. Cl. H01f 7/08

U.S. Cl. 335—266 **9 Claims**



An electro-magnet device in which U-shaped magnetic core plates are provided and arranged one behind the other in staggered relation. Electric coils are placed over the legs of the core plates which are nearest each other. The stacked core plates with the respective coils are disposed adjacent corresponding armatures which are tiltably mounted on a support shaft extending perpendicular to the core plates. The electromagnet arrangement is particularly useful for use with digital processing devices, especially for actuating the printing wheels thereof.

3,821,673

ROTARY SOLENOID HAVING A LARGE ANGLE OF ROTATION

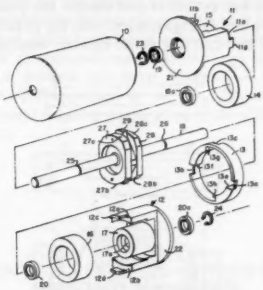
Ralph K. Daugherty, and Gary A. Halvorsen, both of San Jose, Calif., assignors to Genevieve I. Hanscom; Robert Magnuson and Louis J. Thomson, all of San Jose, Calif., Trustees of the Estate of Roy M. Magnuson, decreased, part interest to each

Filed June 21, 1973, Ser. No. 372,158

Int. Cl. H01f 7/08

U.S. Cl. 335—267 **5 Claims**

A dual rotary solenoid provided with coils each of which has an armature associated therewith for driving a shaft either clockwise or counterclockwise through predetermined angles from a predetermined position. The coils are mounted on opposing cores of magnetic material, the faces of the pole pieces of which are offset with respect to each other. The cores are shaped so that the radial air gaps between the faces of the armature and the opposing faces of the pole pieces diminish in length as the armatures are rotated to their positions of minimum air gap.



3,821,674

ELECTROMAGNETIC RELAY ARMATURE MOUNTING

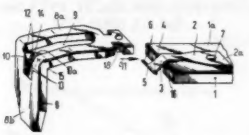
Martin Aidn; Gerhard Furtwangler, both of Munich, and Eberhard Wanka, Dachau, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 12, 1973, Ser. No. 350,315

Claims priority, application Germany, Apr. 17, 1972, 2218493

Int. Cl. H01f 7/08

U.S. Cl. 335—270 **10 Claims**



An L-shaped armature is mounted on a supporting yoke associated with an electromagnetic relay coil in a manner enabling easy straight line assembly and removal of the armature and assuring positive mounted retention of the armature for efficient functioning for its intended purpose. Retention of the armature is effected by a leaf spring having a generally Z-shaped portion extending through an aperture in the armature and engaging with an anchor edge aligned with the rocking fulcrum of the armature. Straight line assembly is facilitated by a cam terminal on the free end portion of the spring and a cam surface tooth formation on the armature. Interlocking shoulders on the spring and the armature assure positive retention of the armature on the yoke.

3,821,675

SOLENOID ASSEMBLY AND THERMOELECTRIC FLAME FAILURE DEVICE

Ernst Sohnchen, Huckeswagen, and Ernst Feldmann, Remscheid, both of Germany, assignors to Joh. Vaillant K.G., Remscheid, Germany

Filed Nov. 24, 1972, Ser. No. 309,149

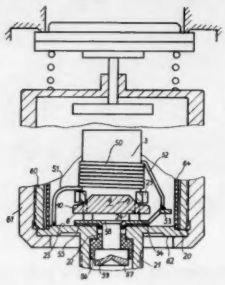
Claims priority, application Germany, Mar. 23, 1972, 2214063

Int. Cl. H01f 7/08

U.S. Cl. 335—281 **9 Claims**

In the solenoid assembly, a U-shaped electromagnet includes two core legs defining between them a space which is

open at both ends, and a yoke connecting said core legs at one end thereof and having a bearing surface in contact with a carrying plate. Flange means are rigid with and project from the carrying plate and extend in part outside the yoke and in part into the space and in engagement with the yoke to clamp the same against said carrying plate. Electric winding means surround the core legs. The solenoid assembly is intended for use in a flame failure device, which comprises a valve stem and an armature plate which is connected to the valve stem and disposed adjacent to the ends of said core legs opposite to said yoke and adapted to be magnetically attracted by the core legs in response to a sufficient energization of said winding means.



3,821,676

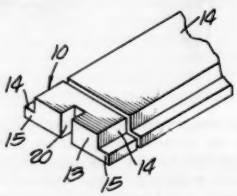
MAGNETIC KEEPER ACCESSORY FOR CONVENTIONAL TOOLS

Harry A. Carr, 2934 El Caminito, La Crescenta, Calif. 91214

Continuation-in-part of Ser. No. 200,077, Nov. 18, 1971, abandoned. This application Jan. 31, 1973, Ser. No. 328,448

Int. Cl. H01f *7/20*

U.S. Cl. 335—285 **22 Claims**



A magnetic keeper accessory selectively mountable on conventional end, box and socket wrenches without need for alterations or attaching expedients. The keeper accessory occupies a portion only of the fastener seating portion of a wrench head and the main body is resilient and shaped and sized to have an interference fit with the wrench head and, if made for use specifically with end and box wrenches, it preferably includes stop means to limit the portion of the accessory inserted into the wrench head. Its mid-portion may be suitably weakened to facilitate bowing in the plane of the wrench head to enhance its gripping action on the wrench head.

3,821,677

TRANSFORMER HAVING MAGNETIC SHIELDS

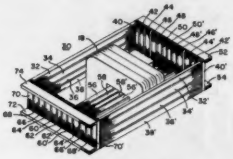
Virgil L. Boaz, Dalewille, Ind., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 18, 1973, Ser. No. 352,370

Int. Cl. H01f *15/04, 27/24*

U.S. Cl. 336—84 **7 Claims**

Leakage flux shields for shell-form power transformers. One shield surrounds the upper portion of the transformer windings and another shield surrounds the lower portion of the transformer windings. Each shield includes a plurality of laminated magnetic bundles arranged to form closed magnetic paths around the transformer windings. Each of the joints between adjacent bundles in the flux paths are formed by bundle faces which contain an edge of each lamination in the bundle.



3,821,678

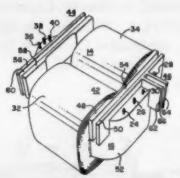
TRANSFORMER HAVING A CAST WINDING STRUCTURE WITH INTEGRAL INSULATING BARRIERS

Edgar R. Eley, Athens, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 2, 1973, Ser. No. 402,683

Int. Cl. H01f *27/02*

U.S. Cl. 336—96 **4 Claims**



A core and winding assembly insulated by a casing constructed of solid insulating material. Insulating barriers project from the casing to prevent electrical arcing and creepage between winding terminals and the core, and between certain winding terminals. An insulating barrier includes plates orientated in parallel relationship with a gap therebetween to increase the creepage distance. The barriers are formed as an integral part of the casing.

3,821,679

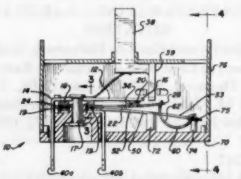
OVERLOAD CIRCUIT BREAKER

Richard D. Summe, 5302 E. 72nd Pl., Indianapolis, Ind. 46250, and Everett H. Vannoy, 500 Hillsdale Ct., Indianapolis, Ind. 46901

Continuation-in-part of Ser. No. 271,603, July 13, 1972. This application May 4, 1973, Ser. No. 357,165

Int. Cl. H01h *61/00*

U.S. Cl. 337—101 **17 Claims**



An overload circuit breaker utilizes a stationary member having a first contact element located on its surface and a

movable resilient member having a sacrificial contact element located on its surface. A resilient bimetallic member is operable as a toggle to control the movable member. An electrical terminal means is connected such that an electrical circuit is formed through the first and second contact elements as well as through the resilient bimetallic member and the movable resilient member. The movable resilient member moves with snap action from the first stable position to the second stable position upon a flow of a predetermined electrical current through the electrical circuit, thereby opening the first contact element and the sacrificial contact element and breaking the electrical circuit. The resilient bimetallic member operates from a single stable position to provide for automatic resetting of the circuit breaker. In some embodiments, an ambient temperature compensating element is provided, and in some, manual reset means are provided.

3,821,680

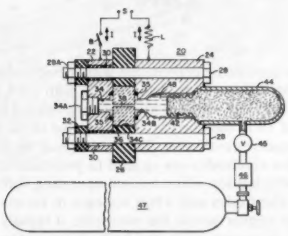
LIQUID METAL CURRENT-LIMITING DEVICE

Howard C. Ludwig, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 14, 1973, Ser. No. 397,565

Int. Cl. H01h *87/00*

U.S. Cl. 337—114 **9 Claims**



An electrical current limiting device employing a liquid electrically conductive metal such as mercury pressurized in an enclosed container at a pressure slightly above its critical pressure. The pressure is confined to a narrow range where the specific conductivity of the mercury may vary by approximately six orders of magnitude for a change in the temperature of the mercury from near room temperature to its critical temperature as the I^2R heating in the liquid is increased due to increase in electrical current. By operating the mercury current-limiting device at a pressure slightly above its critical pressure and a temperature equal to its critical temperature very effective current limiting will take place without the mercury changing state.

3,821,681

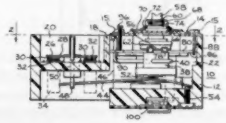
DUAL RANGE HYDRAULIC THERMOSTATIC CONTROL DEVICE

Paul R. Staples, and James A. Dooley, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed June 8, 1973, Ser. No. 368,275

Int. Cl. H01h *37/36*

U.S. Cl. 337—319 **12 Claims**



A dual-range, hydraulic type of thermostat is provided for controlling a pyrolytic, self-cleaning electric baking oven. A calibrated scale is provided associated with a rotary control such that the operator has the maximum resolution of operating temperature for the normal baking operation. A soft detent is incorporated to inform the operator that the Broil position is engaged, and a hard detent is provided with the accompanying shift of operating temperature range to inform that the self-clean process has been engaged. A logic switch, responsive to the operation of the rotary control, is incorporated to insure the proper operating mode of the associated oven circuitry.

3,821,682

THERMOSTAT, PARTICULARLY FOR ROOM TEMPERATURE CONTROL

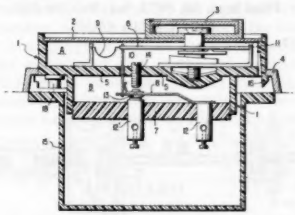
Walter Hollweck, Nurnberg, and Leonhard Nadler, Bad Kissingen, both of Germany, assignors to Inter Control Hermann Kohler Elektrik GmbH & Co. KG, Nurnberg, Germany

Filed Apr. 20, 1973, Ser. No. 353,112

Claims priority, application Germany, Apr. 20, 1972, 2219451

Int. Cl. H01h *37/04*

U.S. Cl. 337—380 **13 Claims**



A thermostat which includes a bimetallic temperature sensor, a device connected to the sensor for setting a desired temperature value and an electric switch actuated by the sensor, has a housing which includes a frontal wall formed by a highly heat conducting front plate that extends in the close vicinity of the sensor disposed in the housing and/or includes a partition which separates the sensor and the electric switch from one another and which extends within the housing spaced from and substantially parallel to the frontal side of the housing.

3,821,683

THERMAL SWITCH

Teamus Bowling, Fern Creek, Ky., assignor to General Electric Company, Louisville, Ky.

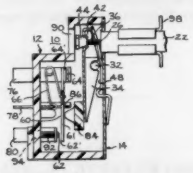
Filed Apr. 17, 1973, Ser. No. 351,848

Int. Cl. H01h *37/46*

U.S. Cl. 337—386 **10 Claims**

A double-point, thermally-responsive, switch assembly for a self-cleaning electric baking oven fulfills several functions. The switch assembly includes a tube-rod type of differential thermal expansion thermostat which serves to translate a rise in temperature into rectilinear motion, which is translated through a ball and socket joint to a motion amplifier lever. The lever in turn effects the opening and closing of a pair of switches. One switch serves as an over-temperature limit pro-

tection for use during the normal baking cycle to effect cutting of power to the baking elements in the event of failure of the primary control system. A second switch is of the double-throw type which is used during the self-cleaning cycle. It serves first to close a first set of contacts to provide power for a cooling fan for keeping the outer wall temperatures of the



oven within safe temperature limits. A second set of contacts, upon opening, removes power from a circuit which provides an electroresponsive means such that, when the temperature within the oven cavity is above a predetermined level, the oven door may not be opened. Means are provided for calibrating or adjusting the temperature at which each of the switches will be caused to be switched.

3,821,684

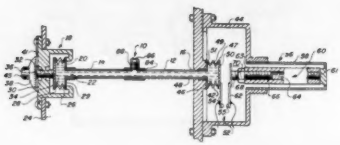
REMOTE SETTING THERMOSWITCH

Richard T. Keating, 144 N. Cuyler Ave., Oak Park, Ill. 60300

Filed Sept. 10, 1973, Ser. No. 396,085

Int. Cl. H01h *37/28*

U.S. Cl. 337—392 **6 Claims**



A remote setting thermoswitch having a temperature sensing element screwed to a threaded adaptor in the wall of a heated zone with a mounting for the indicating dial and a knob flanged for attachment to a remotely placed control panel and a sealed hydraulic system with input and output bellows for the transmission of control signals therebetween.

3,821,685

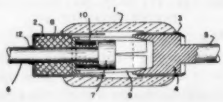
THERMALLY RESPONSIVE NON-RESETTABLE ELECTRIC SWITCH

Stephen F. Kimball, Georgetown; Bernard J. Warren, Gloucester, and David N. Brooks, West Peabody, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Oct. 29, 1973, Ser. No. 410,879

Int. Cl. H01h *37/76*

U.S. Cl. 337—409 **4 Claims**



An electric switch comprises a glass cylindrical envelope having lead-in wires disposed at each end thereof along the central axis of the cylinder. A conical end closure connected to one of the lead-in wires electrically contacts a slotted can within the envelope. Electrical contact between the slotted can and the second lead-in wire is established, utilizing a coil spring and a pellet of meltable material. When the switch attains a temperature high enough to melt the pellet, the switch opens.

3,821,686

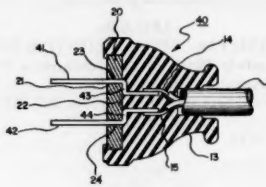
PROTECTIVE CONNECTOR DEVICES

John D. Harnden, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 21, 1971, Ser. No. 191,217

Int. Cl. H01c *7/12*

U.S. Cl. 338—21 **11 Claims**



A power connector is provided with a body of metal oxide varistor material in conductive contact with each of the electrodes thereof. The metal oxide varistor material has an alpha in excess of 10 in the current density range of 10^{-3} to 10^{2} amperes per square centimeter. The portions of the body in contact with the electrodes are spaced to provide a standby current flow which is low when normal operating voltage appears across the electrodes and when voltages in excess of the normal voltage appear across the electrode, a rapidly decreasing impedance is presented by the body in accordance with the alpha of the material of the body, thereby limiting the variation in voltage between the electrodes to a value close to the normal operating voltage.

3,821,687

ARTICULATED COUPLING FOR CONNECTING ELECTRICALLY CONDUCTIVE PARTS

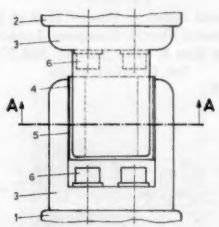
Hans Hartmann; Georg-Heinz Krieter, both of Baden, and Gerhard Mauthe, Wettingen, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Aug. 24, 1972, Ser. No. 283,287

Claims priority, application Switzerland, Oct. 5, 1971, 14554/71

Int. Cl. H01r *7/28*

U.S. Cl. 339—9 R **7 Claims**



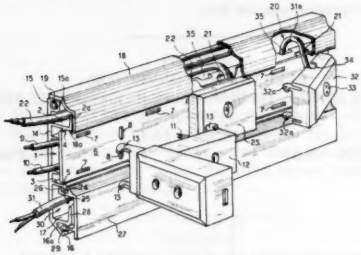
An articulated coupling of the universal type for connecting the ends of two electrically conductive parts comprises two U-shaped yokes orientated at an angle of 90° relatively to each

other and fixed respectively to the parts to be connected, and a connection piece located between the legs of the yokes having a prismatic configuration such as to establish an electrically conducting connection between the side faces of the connection piece and the adjoining inside faces of the yokes. The electrical connection between the prismatic connection piece and the yokes is accomplished by means of pre-stressed arcuate spring strips or plate springs.

3,821,688
WALL SERVICE DUCTS

Jacques Larsile, La Varenne-St.-Hilaire, France, assignor to Technilec, Genesse, France

Filed May 31, 1973, Ser. No. 365,741
Claims priority, application France, June 13, 1972, 72.21155
Int. Cl. H01r *13/60*
U.S. Cl. 339—22 R **6 Claims**

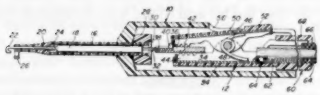


The invention provides a multi-purpose wall service duct for carrying electrical conductors or pipes for fluids. A moulding on which distribution elements can be fixed has an extension defining a lateral channel. One edge of the moulding is engaged by one edge of a cover and the other edge of the cover fits on to the extension of the moulding, and concealed passages are provided between the lateral channel and a connector fixed in position by a distribution element.

3,821,689
ELECTRICAL CONNECTOR

Cleve A. Graham, Port Heuneme, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 29, 1972, Ser. No. 293,747
Int. Cl. H01r *7/06, 7/28*
U.S. Cl. 339—31 T **5 Claims**

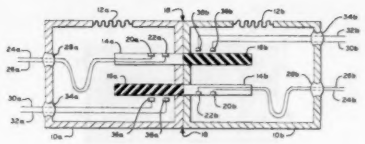


An electrical connector which is comprised of a combination of two different types of clips mechanically and electrically interconnected without leads in a completely externally insulated fashion, specifically a hook- or probe-type clip having a tubular extension within which an alligator clip is removably connected with a slidable clip plate carried by the inner end of the first clip.

3,821,690
UNDERWATER ELECTRICAL CONNECTOR

Frederick B. Small, Syracuse, N.Y., assignor to Crouse-Hinds Company, Syracuse, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,478
Int. Cl. H01r *13/52*
U.S. Cl. 339—75 R **6 Claims**

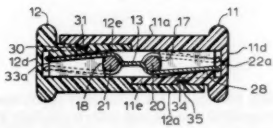


A plug and receptacle for connecting electrical circuits under water, consisting of two mating chambers filled with a dielectric fluid sealed to prevent loss of fluid but having a resilient liquid-tight interface with the surrounding water so that the pressure within the chambers is equalized with the external pressure. Each of the chambers contains a pair of rods which move in opposed synchronized parallel movement such that one rod moves out of one chamber across the boundary and into the second chamber while the second rod is retracted into the chamber. As each rod moves across the boundary, its movement is accompanied by an equal and opposite movement of its counterpart rod in the other chamber. This synchronized seesaw movement results in a zero volume change in each of the chambers. The rods in their transferred position conduct electrical currents from one chamber to the other.

3,821,691
WIRE TERMINAL

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 24, 1973, Ser. No. 399,895
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 R **9 Claims**



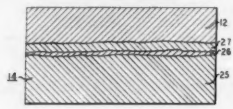
A wire terminal includes a longitudinal strip of electrically conductive material having a plurality of longitudinally arranged fingers laterally spaced in two different planes and a pair of identical U-shaped encapsulating members arranged to mate in locking relationship, each having a plurality of longitudinally arranged cavities divided by abutment walls. The cavities are formed to receive the extending fingers and have converging top and bottom walls so that when the members are locked together, the fingers are placed in spring tension by the converging walls to maintain a constant contact force on a wire placed between the fingers to securely hold the wire in place against the abutment wall and to make intimate electrical contact with the wire.

3,821,692

SLOTTED ELECTRICAL CONNECTOR OF COPPER-BASED ALLOY SEPARATED FROM AN INDIUM COATING BY A BARRIER LAYER

Ralston White Barnard, Dunwoody, Ga., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 19, 1972, Ser. No. 298,809
Int. Cl. H01r 11/20
U.S. Cl. 339—97 P 4 Claims



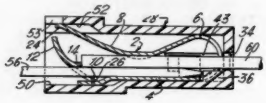
Means are disclosed to maintain the long-life resistance characteristics of contacts used in solderless connectors and fabricated from indium plated, copper based alloy. A barrier layer is plated between the alloy of the contact and the indium layer beneficially used with aluminum conductor wire.

3,821,693

ELECTRICAL CONNECTOR AND CONTACT THEREFOR

Helen Dechelette, Saint Cloud, France, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 21, 1973, Ser. No. 334,506
Claims priority, application France, Feb. 29, 1972, 72.06932
Int. Cl. H01r 9/00
U.S. Cl. 339—217 S 6 Claims



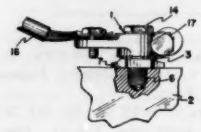
An electrical connector for releasably interconnecting first and second electrical conductors inserted axially into the connector in opposite senses, the connector comprising an insulating housing and a spring metal contact element retained therein, the housing having at one of two opposite ends of the housing a first opening for receiving the first conductor and at the other of the two opposite ends a second opening for receiving the second conductor, the connector having a stop surface adjacent to but offset from the second opening of the housing for engagement by the leading end of the first conductor; the contact element comprising first and second arms connected by and extending in the same general direction from a bight for resiliently engaging the conductors simultaneously between them, the bight having an opening aligned with and adjacent the second opening of the housing for receiving the second conductor and the contact element having a detent adjacent the first opening of the housing for engaging the first conductor to restrain it from withdrawal from the first opening.

3,821,694

BATTERY TERMINAL AND CABLE CONNECTOR

Robert G. Gottlieb, Prairie Village, Kans., assignor to Lewis Industries, Inc., Kansas City, Mo.

Filed Oct. 6, 1972, Ser. No. 295,498
Int. Cl. H01r 11/26
U.S. Cl. 339—232 5 Claims



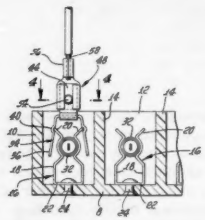
A battery terminal has a tapered body with an axially projecting threaded mounting stud and an integral wrench hex grasping ring. A wire receiving hole projects transversely through the body and an exial threaded bore carries a clamping bolt extending into the hole.

3,821,695

ELECTRICAL CONNECTOR

Lawrence J. Sholer, 15848 Moorpark St., Encino, Calif. 93301

Filed July 9, 1973, Ser. No. 377,207
Int. Cl. H01r 13/12
U.S. Cl. 339—258 F 6 Claims



An electrical connector particularly adapted for use on land and water vehicles and other motor powered equipment having cartridge fuses held by spring arms, the connector being adapted for mounting on the end of a wire conductor and secured to the fuse holder by snapping it over the divergent ends of the fuse holder arms, the connector having resilient legs with opposed grooves for receiving the ends of the fuse holder arms, and the grooves being provided with end stops to keep the connector from sliding laterally off of the fuse holder. Also, wire conductor terminal means supported by the connector in a position to prevent interference with the connector attachement to the fuse holder, the article being securable to the fuse holder and to the wire conductor without tools.

3,821,696

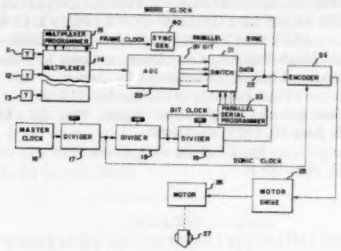
DOWNHOLE DATA GENERATOR FOR LOGGING-WHILE-DRILLING SYSTEM

John W. Harrell, Duncanville; Bobbie J. Patton, Dallas, and Billy G. Ballard, Garland, all of Tex., assignors to Mobile Oil Corporation, New York, N.Y.

Filed Mar. 13, 1973, Ser. No. 340,789
Int. Cl. G01v 1/40
U.S. Cl. 340—18 LD 11 Claims

A logging-while-drilling system includes a downhole digital data generator. A multiplexer applies analog signals representing sensed downhole conditions to an analog-to-digital con-

verter. The digital bits are stored in the analog-to-digital converter while a programmed switching means sequentially switches each of the parallel bits to a single output to convert the parallel bits to a serial-by-bit signal. An encoder responds to the serial-by-bit signal to control the speed of a rotor in the transmitter to produce a phase encoded sonic signal in the



drilling liquid in the well being investigated. A stable source of high frequency clock pulses is used to generate all of the required timing clock pulses with high resolution. In order to do this, serial frequency dividers count down the basic clock pulse to produce sonic pulses, bit clock pulses, word clock pulses and frame clock pulses.

3,821,697

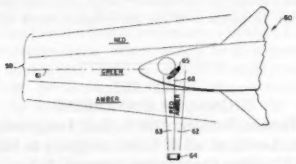
VISUAL LANDING AND SURFACE GUIDANCE APPARATUS

Albert D. Brown, Atlanta, Ga., assignor to Highway Traffic and Safety Corporation, Atlanta, Ga.

Filed Aug. 31, 1972, Ser. No. 285,438

Int. Cl. G08g *5/00*

U.S. Cl. 340—26 **13 Claims**



Apparatus for providing one or more beams of distinctive illumination capable of providing visual guidance information to the operator of a vehicle such as an aircraft, a marine vehicle, an automotive vehicle, or the like, as well as pedestrian guidance and control. The disclosed embodiments of the present invention project at least two visual guidance beams of contrasting colors, and the projection apparatus includes a color filter assembly which is selectively positionable to cause the guidance beams to be selectively projected in any of a plurality of planes, so that the same apparatus is useful for a variety of applications such as aircraft glide slope beam projection, wherein the beams of illumination are projected in a vertical array, and for surface guidance, wherein the beams are typically projected in a horizontal array. A disclosed embodiment of the present invention provides visual information enabling an operator of a vehicle to position the vehicle precisely at a predetermined stopping or turning location.

3,821,698

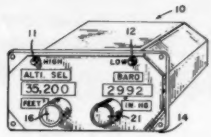
ALTITUDE ALERTING SYSTEM

Earl Levell Tippetts, Reno, Nev., assignor to Lear Avia Corp., Reno, Nev.

Filed July 13, 1972, Ser. No. 271,562

Int. Cl. G05d *1/00*

U.S. Cl. 340—27 NA **6 Claims**



An alerter for use in aircraft to provide the pilot with visual and aural signaling of his altitude course with respect to a preselected flight altitude. A transducer senses the aircraft's altitude and generates corresponding electrical signals that are compared with that of the selected altitude. A computer-control unit derives alerting signals that selectively energize a "high" or a "low" pilot light to indicate when the pilot is above or below the desired altitude. A preset "inner" distance therefrom, as 500 feet in either direction, defines a clearance window that denotes on-altitude. Also, a horn is sounded when the plane departs from such inner window, as well as when it approaches within a preset "outer" range from the set altitude, as 1,000 feet. The pilot is thereby alerted by simple yet effective indications to guide him in acquiring or maintaining his desired altitude.

3,821,699

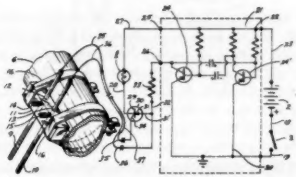
DEPTH SENSOR FOR BOAT TRAILERS

Louis J. Marus, Millington, and James D. Abernathy, Memphis, both of Tenn., assignors to Louis J. Marus, Millington and Irvin Bogatin, Memphis, both of, Tenn., by said Abernathy, part interest to each

Filed Nov. 17, 1972, Ser. No. 307,474

Int. Cl. G08b *21/00*

U.S. Cl. 340—59 **4 Claims**

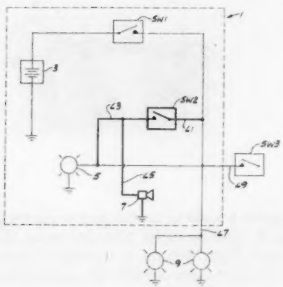


A depth sensor for boat trailers comprising a signaling device positionable within the interior of a towing vehicle, a source of current connected to said signaling device, a normally open switch between said signaling device and said source of current, and a switch closing circuit including electrodes mounted upon the trailer for current conduction therebetween when immersed in water to thereupon cause said signal to be energized.

3,821,700
WARNING SYSTEM INDICATING CONCURRENT ACTUATION OF ACCELERATOR AND BRAKE CONTROLS

Ernest R. Russell, 1215 Central Pky., Florissant, Mo. 63031

Filed July 26, 1973, Ser. No. 382,970
Int. Cl. B60q *1/26*
U.S. Cl. 340—66 3 Claims

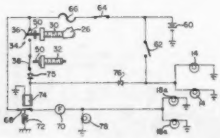


A warning system for a vehicle having an acceleration control means and a braking control means for providing indication of concurrent actuation of both of the means. A first switch closes in response to actuation of the brake control means while a second switch closes in response to actuation of the acceleration control means. Indicator means provide a warning signal when energized by a source of electrical power. An electrical circuit includes both of the switching means series-connected between the power source and the indicator means so that upon concurrent actuation of the brake control means and the acceleration control means a warning is provided by the indicator means.

3,821,701
AUTOMOBILE DECELERATION INDICATING DEVICE

Lee E. Ross, 12412 N.E. 6th Pl., Bellevue, Wash. 98005

Filed May 10, 1972, Ser. No. 251,948
Int. Cl. B60q *1/26*; G08b *21/00*; H01h *3/14*
U.S. Cl. 340—71 12 Claims



A caution light mounted on the rear of an automobile to indicate to a following motorist that the automobile is decelerating. Two control switches for the caution light are mounted to the two idler adjustment screws of the carburetor and the caution light is activated by either of the idler screws engaging a respective stop member when the throttle arm moves to its idle position. Activation of either the brake switch or movement of the throttle arm to a power position turns off the caution light.

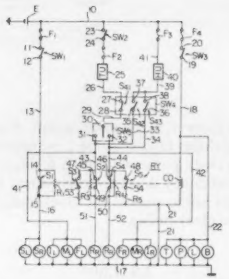
In a second embodiment, the conventional backup lights of the automobile function as caution lights, with a flasher causing intermittent activation of the backup lights when functioning as a caution indicator.

In a third embodiment, there is a green "go" light which is activated when the automobile is moving forward under power, this "go" light being deactivated by the closing of the brake switch, movement of the throttle arm to its idle position to activate the caution light control switch, or operating the automobile in reverse.

3,821,702
LIGHTING SYSTEM FOR CONTROLLING LIGHTS OF MOTOR VEHICLE TO GLOW IN A REDUCED LUMINOUS INTENSITY DURING THE NIGHTTIME

Takaaki Mogi, Fujisawa City, Japan, assignor to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Feb. 22, 1972, Ser. No. 227,981
Claims priority, application Japan, May 22, 1971, 46-41765; June 30, 1971, 46-56980
Int. Cl. B60q *1/38*; G08b *5/36*
U.S. Cl. 340—81 R 1 Claim

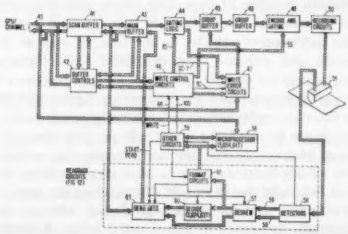


A lighting system for lighting various lamps installed in a motor vehicle, comprising at least one flasher unit for producing a turn signal having a constant repetition frequency, at least one lamp, connecting circuit for connecting said flasher unit direct to said lamp or through a resistor to said lamp, and a shunt circuit for bypassing through a resistor the lamp and the connecting circuit when the connecting circuit connects the flasher unit to the lamp through resistor. The load impedance of the flasher unit is therefore maintained constant so that the load current of the flasher unit stays constant whereby the repetition frequency of the turn signal stays substantially constant.

3,821,703
SIGNAL TRANSFERRING

Ernest W. Devore, Boulder; Phil H. Hall, Longmont, and John W. Irwin, Loveland, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1972, Ser. No. 318,453
Int. Cl. G06f *11/12*
U.S. Cl. 340—146.1 AL 61 Claims



In a magnetic recording system or other data signal transfer apparatus, signal blocks of indeterminate length are handled

with fixed length code record segments. Enhanced error detection and correction is provided not only on the data bits in each segment, but also on block check bits. When less than the total number of data bits to be transferred is insufficient to fill a fixed length segment, a residual segment is transferred. The residual segment preferably consists of the residual data bits, a check field (CRC) on the data bits as transferred through a buffer system, plus padding bits to make the total number of bits equal to a full length segment. Immediately following the residual segment is a check bit segment which contains a second check (CRC) character. To facilitate checking, a dual modulus counting scheme is employed to determine the number of CRC check bits to be included in the check bit segment. If the number of segments is odd, then an odd number of CRC bytes is transferred. If the total number of segments is even, then an even number of CRC bytes is transferred. Padding bytes make up the remainder of the check bit segment. The odd/even count between the successive segments is also used as a format check.

3,821,704

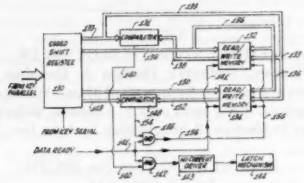
SELF RE-KEYING SECURITY DEVICE WITH CODED KEY

Daniel M. Sabsay, 123 N. Kingsley Dr., Los Angeles, Calif. 90004

Continuation of Ser. No. 234,157, March 13, 1972, abandoned. This application Apr. 16, 1973, Ser. No. 351,298

Int. Cl. H04q *3/00*

U.S. Cl. 340—149 A **21 Claims**



A security system for use in secure areas, buildings, hotels, automobiles and so forth. Each lock mechanism is controlled by a decoding circuit having a changeable binary memory. A basic key has two decodable information fields: a key field and an authorization field. When a key field is sensed by the decoding circuit and found to contain a number equal to the combination previously stored in the decoding circuit memory, the lock mechanism is opened. If the comparison does not find a match, the authorization field number and the combination are then compared. If they are found to be equal, the decoding circuit memory changes itself to the number found in the key field and the lock mechanism opened. In this way, lock combinations may be changed. In addition, the key may contain other information fields, such as various levels of master combinations, key insertion information, and so forth.

3,821,705

DATA COMMUNICATION SYSTEM AND APPARATUS

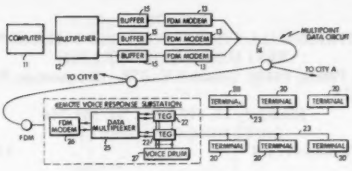
Allan Chertok, Bedford, and Timothy C. Gillette, Cambridge, both of Mass., assignors to Concord Computing Corporation, Bedford, Mass.

Filed Oct. 12, 1972, Ser. No. 296,790

Int. Cl. H04m *11/06*

U.S. Cl. 340—152 R **4 Claims**

A system for interrogating a computer via telephone lines from a number of dispersed inquiry locations included on a party line. The system has a keyboard, a tone pair oscillator and an idle tone recognition circuit. Digital entries are made and stored at the terminal and, when the message has been completely entered, it is transmitted in tone pair code only if the terminal senses an idle tone indicating that the party line is available. At a local sub-station the initial tone pair code halts the generation of the idle tone for that party line and the total message is transmitted over trunk lines in digital bit form to the central computer. The computer reply is transmitted back



in the same form to the city sub-station where it is converted through a voice response unit to a voice message for transmission along the party line to the originating terminal which includes a standard telephone receiver. The remainder of the terminals on this party line are inhibited from receiving this voice response.

3,821,706

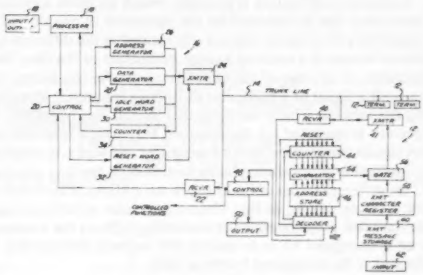
COMPUTER SYSTEM

Melvin T. Bennett; Thomas L. Vlach; Allan I. Edwin, and Gino Venturi, all of Ann Arbor, Mich., assignors to Interactive Systems, Inc., Ann Arbor, Mich.

Filed Mar. 29, 1973, Ser. No. 345,945

Int. Cl. H04q *9/00*

U.S. Cl. 340—163 H **21 Claims**



A plurality of remote terminals are connected to a central computer through a full duplex communication channel. Each terminal has a register which stores the unique address for that terminal, a counter and a comparator circuit for determining identity between the state of the counter and the address. The computer transmits messages to all of the remote terminals consisting of digital word groups preceded by a particular terminal address. These messages are received by all of the terminals and only processed by the terminal so addressed. All of the terminals advance their counters in response to each word transmitted by the computer, whether that word is addressed to them or not. In the absence of a message to be sent to the terminals, the computer transmits an idle word which advances all of the counters. Upon the occurrence of identity between its counter and its address, a terminal will transmit any available message to the computer on the return channel. Periodically, a word is sent out by the computer resynchronizing all of the counters. In one alternate embodiment the central station communicates with a plurality of satellite stations, each of which services a plurality of terminals and interrogates them in sequence, one each time that satellite's counter coin-

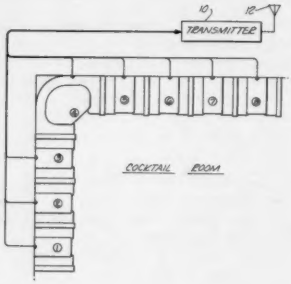
cides with its address. In another alternate embodiment all of the terminals connected to a particular satellite are sequentially interrogated as the counter in the satellite is advanced by sequential words generated by the computer, and then the computer transmits the address of another satellite causing its terminals to be sequentially interrogated.

3,821,707

WAITRESS CALL SYSTEM FOR COCKTAIL LOUNGE, RESTAURANT, OR THE LIKE

Cal F. Peters, 11100 Gibson S.E. D78, Albuquerque, N. Mex. 87123

Filed July 23, 1973, Ser. No. 381,744
Int. Cl. H04q 9/10; G08b 7/00
U.S. Cl. 340—171 R **5 Claims**



A wireless call system is provided which includes a central transmitter that is activated by the operation of any one of a multiplicity of switches respectively located at the different tables or booths at a cocktail lounge, restaurant or the like. The actuation of any one of the switches causes the transmitter to transmit a signal of a particular distinctive frequency identifying the table at which the particular switch was operated. A receiver is mounted on the waitress' tray which responds to the signals transmitted by the transmitter and which is coupled to a plurality of indicating lights mounted on the tray relating to the different tables or booths. Selective means is included in the receiver circuit, so that when a particular switch at a particular table is operated, a corresponding light on the waitress' tray is energized so as to inform the waitress that service is desired at the designated booth or table.

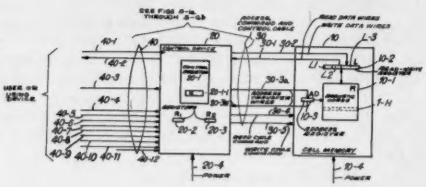
3,821,708

ELECTRONIC CONTROL UNIT FOR THE LINKING OF SYMMETRICAL CLOSED CHAINS OF WORDS IN A RANDOM-ACCESS MEMORY

Boris Alexandre Sokoloff, 4 rue Boris Vilde, 92 Fontenay aux Roses, France

Continuation of Ser. No. 39,038, May 20, 1970, abandoned. This application Aug. 17, 1972, Ser. No. 281,275
Claims priority, application France, May 20, 1969, 69.16325
Int. Cl. G06f 7/38, 13/06
U.S. Cl. 340—172.5 **4 Claims**

An electronic logical sequential and timing unit used as an information retrieval device connected to a conventional binary coded non-permanent storage unit. The phases of the sequential unit and the externally modifiable contents of two specialized registers act together, upon external commands to the sequential unit, to modify in a prescribed manner, the contents of specialized segments or pointers of the two words whose addresses are specified by the two specialized registers and the pointers of two other words directly linked to the first two words. The principal commands merge two closed symmetrical chains in one of the addresses specified by the two specialized registers corresponding to two words or members of two different chains and alternatively split one closed symmetrical chain into two separate chains if the two words are members of the same chain. An initialization command merges all of the words of the memory in a unique closed symmetrical chain used further as garbage collector or reserve chain. Other commands and means are used for the testing of the eventual vacuity of a chain whose address at one of the



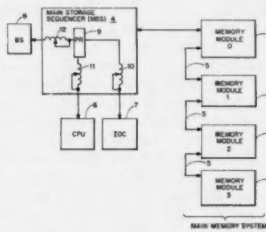
members is specified by the content of the address register of the random access memory. Other commands and means are used for the writing or the reading of the contents of another segment of the words, usually binary coded form of symbols of information, especially the writing or reading of the contents of all of the members of a chain in the backward or in the forward direction. The invention is applicable to electronic automatic computers especially for the processing in real time of data structured in files.

3,821,709

MEMORY STORAGE SEQUENCER

John L. Curley, Sudbury; Thomas J. Donahue, Hudson; Benjamin S. Franklin, Boston, all of Mass.; Wallace A. Martland, Nashua, N.H., and Louis V. Cornaro, Billerica, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 5, 1972, Ser. No. 295,331
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 **16 Claims**



An asynchronous Memory Store Sequencer (MSS) for processing information between Main Memory Store (MMS) and a Central Processing Unit (CPU) or Input Output Control unit (IOC), and for resolving conflicts for memory access between the CPU and the IOC. The MSS interfaces with four Main Memory Modules which may be two-way or four-way interleaved. Information is generally processed from or to the CP via a high-speed low-capacity Buffer Store, whereas information from or to the IOC is processed direct to Main Memory under control of the MSS. Simultaneous requests for access into or out of Main Memory Store (MMS) by the CP or IOC are resolved by priority resolving means in the MSS in favor of the IOC; moreover the MSS can reserve the MMS for the IOC even though the IOC is not currently requesting use of MMS. Priority is resolved by delaying a request for main memory by the CP for a time sufficient to insure that the IOC gains control of the MSS.

3,821,710
MULTIMODE SEARCH AND RETRIEVAL TAPE SYSTEM

Genio R. Arciprete, Lexington, and Peter G. Martin, Arlington, both of Mass., assignors to Arthur D. Little Inc., Cambridge, Mass.

Filed Dec. 4, 1972, Ser. No. 311,489
Int. Cl. G06f *3/06*; G11b *15/00*
U.S. Cl. 340—172.5 21 Claims

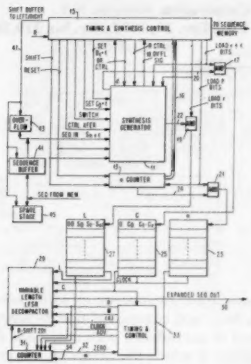
A word processing system that includes a mass storage means in which data is stored in blocks containing a plurality of characters with each data block having a unique address number code associated with it, means for searching the mass storage means to locate individual data blocks by reference to the address numbers, and means for displaying the address number of each data block from which data is being retrieved. The system has the capability of searching the mass storage means at a high or a slow speed in forward and reverse directions, and includes means, operative upon termination of searching in the fast forward, fast reverse and slow reverse modes, for automatically shifting to the slow forward speed mode and for thereafter terminating searching in the slow forward speed mode after a single address code and all of the data in the data block associated with that single address code have been read out. The means for displaying the address numbers is coupled responsively to a counter that is incrementated or decremented by one count each time an address code is detected during searching in the fast forward, fast reverse and slow reverse modes and is preset to the stored address number during searching in the slow forward mode.

3,821,711
SELF ADAPTIVE COMPRESSION AND EXPANSION APPARATUS FOR CHANGING THE LENGTH OF DIGITAL INFORMATION

Robert Runyon Elam, Manassas, Va.; Ralph Marc Heller, Gaithersburg, and Eugen Igor Muehldorf, Potomac, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1972, Ser. No. 318,330
Int. Cl. G06f *5/00*
U.S. Cl. 340—172.5 10 Claims

Digital information, defined by a sequence S, is compressed by a Synthesis Generator, Counter and Timing Circuits into a plurality of blocks of digital data, one block defining an initial loading vector L, a second block defining a connective vector C and a third block defining a length count *n*, , the sum of the lengths of the digital data in the blocks being less than the length of the sequence S they represent. A linear feedback shift register of R stages where R is a limit stop or an integer is selected for optimum processing of the first, second and third blocks into the sequence S. Source means provide the linear feedback shift register a first, second and third source signals defining the loading vector L, the connective vector C and the length count *n*, respectively. Timing, counting and control

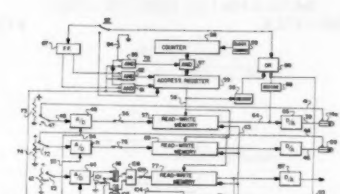


means provide further signals to the linear feedback shift register to adaptively expand or reconstruct the sequence S from the first, second and third source signals.

3,821,712
MUSICAL SEQUENCER

William H. Wetzel, Neptune, N.J., assignor to Sonic Industries Incorporated, Morristown, N.J.

Filed Dec. 29, 1972, Ser. No. 319,635
Int. Cl. G11c *7/00*
U.S. Cl. 340—172.5 11 Claims

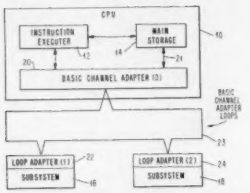


A muscial sequencer for producing control voltages is disclosed together with an electronic device for producing music controlled by the electronic voltages. The electronic device disclosed includes a voltage controlled oscillator, a pair of voltage controlled amplifiers and a speaker normally actuated by a keyboard. The electronic device is electrically and mechanically adapted to be controlled by the musical sequencer. The musical sequencer consists of three rewrite memories and control circuitry therefor.

3,821,713
MULTIPLE-STATION RECEIVER-CONTROLLED TRANSMISSION LOOP INTERFACE FOR DATA TRANSFER AND CONTROL BETWEEN DATA PROCESSING SYSTEMS AND SUBSYSTEMS

Dennis Broadhurst, La Grangeville, and Brian B. Moore, Syracuse, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,260
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **8 Claims**

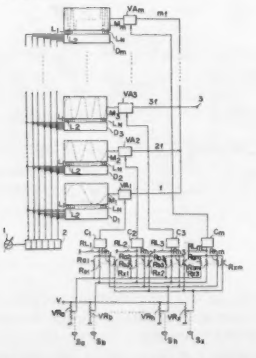


A communication mechanism in which subsystems are attached in a loop and communication between subsystems is accomplished in accordance with a demand-frame/response-frame discipline in which the receiving subsystem in the loop controls the frame generation mechanism with respect to another subsystem. A frame is the smallest unit of information transmitted between units attached to an interface between subsystems and may be used for data and/or control information. Frames are transmitted between subsystems over the interface in a bit-serial form. Each attached subsystem has a line adapter which 1) receives frames in parallel form from the unit's frame logic and transmits the frames in a bit-serial form to the proper attached subsystem, and 2) receives the frames in a bit-serial form from other attached subsystems and transmits them in parallel form to the subsystem's frame logic.

3,821,714
MUSICAL TONE WAVE SHAPE GENERATING APPARATUS

Norio Tomisawa; Yasuji Uchiyama; Takatoshi Okumura, and Toshio Takeda, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shijuoka-ken, Japan

Filed Jan. 15, 1973, Ser. No. 323,582
Claims priority, application Japan, Jan. 17, 1972, 47-6754; Jan. 17, 1972, 47-6755; Jan. 17, 1972, 47-6756
Int. Cl. G10h *1/00*; **G06f** *7/00, 13/00*
U.S. Cl. 340—172.5 **9 Claims**



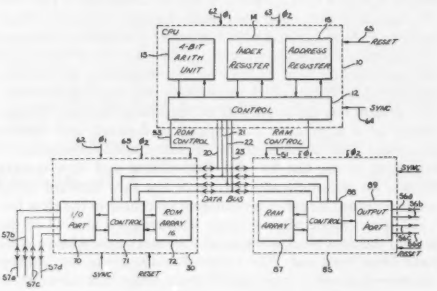
A plurality of memories are provided for storing, in analog representation, the sampled valves of a one cycle sinusoidal wave of the fundamental frequency, a two cycle sinusoidal wave of the second harmonic, . . . and an *m* cycle sinusoidal wave of the m-th harmonic. These memories are read at the same reading rate. The read out sinusoidal wave are controlled in their relative levels in accordance with the tone-color and amplitude of a musical tone wave shape to be obtained. The sinusoidal waves thereafter are synthesized to produce the desire tone-color wave shape. The levels of the read out sinusoidal waves are controlled by changing the amplification degree of variable amplifiers respectively provided on the output side of the respective memories.

Alternatively, memories are provided for storing these sinusoidal waves digitally. The digital signals read from these memories are applied to corresponding multipliers. The multipliers receive, on the other hand, digital control signals for controlling the level of each sinusoidal wave in accordance with the tone-color and amplitude of the musical tone wave shape to be obtained. These two kinds of digital signals are multiplied with each other in these multipliers. The outputs of the multipliers are applied to an adder, where they are added together. A digital signal representing the addition result is converted to an analog signal by a digital-to-analog converter to produce the desired musical tone wave shape.

3,821,715
MEMORY SYSTEM FOR A MULTI-CHIP DIGITAL COMPUTER

Marcian Edward Hoff, Jr., Santa Clara; Stanley Mazor, Sunnyvale, and Federico Faggin, Cupertino, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jan. 22, 1973, Ser. No. 325,511
Int. Cl. G06f *13/00*; **G11c** *11/44*
U.S. Cl. 340—172.5 **17 Claims**



A general purpose digital computer which comprises a plurality of metal-oxide-semiconductor (MOS) chips. Random-access-memories (RAM) and read-only-memories (ROM) used as part of the computer are coupled to common bi-directional data buses to a central processing unit (CPU) with each memory including decoding circuitry to determine which of the plurality of memory chips is being addressed by the CPU. The computer is fabricated using chips mounted on standard 16 pin dual in-line packages allowing additional memory chips to be added to the computer.

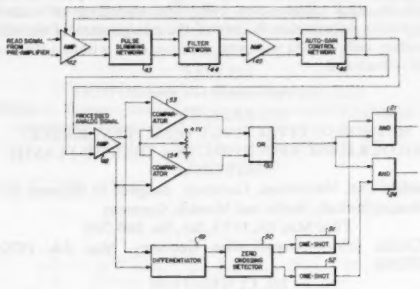
3,821,716
METHOD AND APPARATUS FOR RECOVERING DATA IN AN NRZI RECORDING SYSTEM

Parviz Ghajar, Norman, Okla., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Mar. 5, 1973, Ser. No. 334,530
Int. Cl. G06f *11/00*
U.S. Cl. 340—172.5 **2 Claims**

Apparatus for detecting missing pulses in recovered NRZI encoded data. Positive and negative read signals are separated and applied to different error detecting circuits. Each error detecting circuit has a three stage, serial-transfer, shift register. The second stage output is connected to one circuit output terminal. The first and third stage outputs are applied

to a conventional AND gate. The AND gate transmits an output pulse to the second circuit output terminal whenever the first and third stages contain logical "1"s since the NRZI code



dictates that an intermediate pulse of the opposite polarity must be missing. The circuit output terminals from both error detecting circuits are connected to the input of an OR gate.

3,821,717

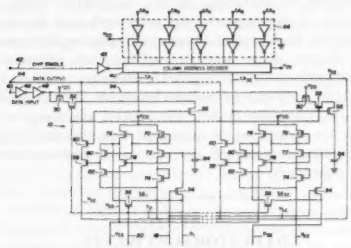
DYNAMIC RANDOM ACCESS MEMORY

Vernon G. McKenny, Garland, Tex., assignor to Mostek Company, Carrollton, Tex.

Filed Nov. 29, 1971, Ser. No. 202,899

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **5 Claims**



A dynamic random access memory utilizing MOSFET transistors formed on a single semi-conductor chip is described. The random access memory utilizes 1,024 binary storage cells arrayed in rows and columns. Each row of cells has a read line and a write line. Each column of cells has one data line used for both read and write functions. Each cell is comprised of a write transistor and a pair of read transistors. The write transistor couples a capacitive storage node to the data line and is controlled by the write line.

The read transistors are connected in series between the data line and VSS, and one is controlled by the read line and the other is controlled by the voltage on the storage node. A sense amplifier is provided for each data line and is used to apply data through the write transistor to the storage node, and to sense the state of the second read transistor controlled by the data stored on the storage node. The chip includes row and column address means for selecting a particular cell for either read or write mode.

The chip also includes a number of features to prevent bipolar injection caused by forward biasing a PN junction as a result of capacitive coupling between various nodes in the circuit, and other features which prevent the loss of data from the storage node.

3,821,718

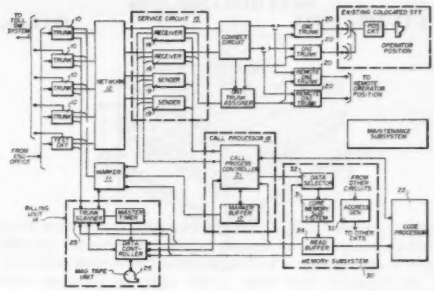
TRUNK TIMER WITH EXACT TIME FEATURE

Richard A. Padgeti, Lombard, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 25, 1972, Ser. No. 300,555

Int. Cl. G11c *13/00*

U.S. Cl. 340—173 R **9 Claims**



A trunk timer for use in a communication system for providing a "grace period" on answer for the called party, as well as timing for forcibly releasing a held trunk circuit. The arrangement also is such that the "exact time" conservations which are established can be more precisely determined, when such "grace periods" and "forcibly released" timing are provided.

3,821,719

SEMICONDUCTOR MEMORY

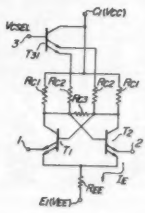
Kenji Taniguchi; Ichiro Imaizumi, and Atsuo Hotta, all of Kokufuji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 151,222, June 9, 1971, abandoned. This application Apr. 27, 1973, Ser. No. 355,271

Claims priority, application Japan, June 12, 1970, 45-50256

Int. Cl. H03k *3/286*; **G11c** *11/40, 7/00*

U.S. Cl. 340—173 FF **8 Claims**



A semiconductor memory comprising a plurality of memory cells, each cell including a pair of two-emitter transistors each having the collector connected to the base of the other transistor in the pair, one emitter connected to like emitter of the other transistor and to a common emitter bias terminal through an impedance element, and the other emitter connected to a corresponding one of bit drive lines in pair. The collectors of the transistors in pair are connected through respective switched impedance elements to a common collector voltage terminal, the respective switched impedance elements offering a small impedance when the collector voltage is at a high level and a large impedance when the collector voltage is at a low level.

3,821,720
STORAGE DEVICE USING CHOLESTERIC/NEMATIC LIQUID CRYSTALS

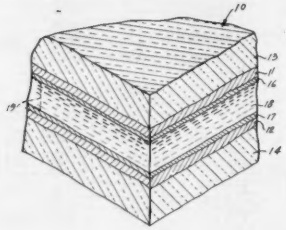
Waldemar Greubel; Hans Krueger, and Ulrich Wolff, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 9, 1973, Ser. No. 358,709

Claims priority, application Germany, May 10, 1972, 2222974

Int. Cl. G11c *13/00, 13/04*

U.S. Cl. 340—173 LS **12 Claims**



An improved image storage device of the type utilizing a liquid crystal composition comprising material having nematic liquid crystallinity and material having cholesteric liquid crystallinity is provided together with an improved method of temporary image storage and erasure. The liquid crystal composition has positive dielectric constant anisotropy and shorter extinction times compared to prior art.

3,821,721
IMAGE DISPLAY APPARATUS

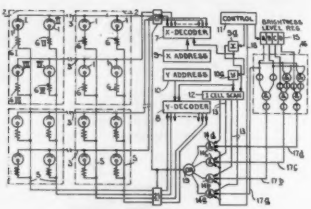
Gordon Hughes, Macclesfield, England, assignor to International Computers Limited, London, England

Filed Mar. 15, 1973, Ser. No. 341,652

Claims priority, application Great Britain, Mar. 15, 1972, 11925/72

Int. Cl. G11c *11/28, 11/32;* **H05b** *37/00*

U.S. Cl. 340—173 PL **6 Claims**



Apparatus for displaying an image on an arrangement of gas discharge cells is disclosed in which a matrix of image display cells is formed by the interlacing of a number of elementary cell matrices. The elementary cells are so arranged that corresponding single cells from all the elementary matrices fall within each image display cell. The brightness of each image cell is therefore dependent upon the number of its elementary cells which are energised and the brightness level of those energised elementary cells. By arranging that the individual elementary cells of an image cell have different brightness levels and selecting appropriate combinations of these elementary cells to be energised a brightness range of at least 12:1 is possible for a single image cell, thus allowing the arrangement to display half-tone images acceptably. Tone separation of a displayed image is possible by reducing the brightness range of the display cells. The variations in brightness of the elementary cells may be achieved by, for example, the incorporation of optical filters, such as neutral density filters, to absorb light from some of the elementary cells within an image cell or by regulating the current permitted to flow in each elementary cell. The decoding of coded brightness information to control the energisation of the elementary cells during scanning of those cells within a display cell is disclosed.

3,821,722
METHOD OF EFFECTING CYCLIC, REVERSIBLE, HOLOGRAPHIC RECORDING IN A THERMO-PLASTIC MATERIAL

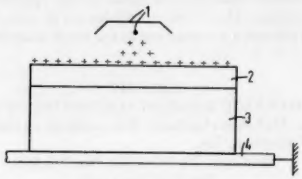
Joachim Ost, Martinried, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 16, 1973, Ser. No. 360,768

Claims priority, application Germany, May 24, 1972, 2225266

Int. Cl. G11c *11/46*

U.S. Cl. 340—173 TP **1 Claim**



A method of effecting cyclic, reversible, holographic recording in a thermoplastic material including the steps of sensitizing the thermoplastic material by placing the same by a corona charge at a positive or negative potential and thereafter performing a holographic exposure and developing and fixing by cooling the resultant hologram. By increasing the number of recording cycles, the corona discharge voltage required for sensitizing is increased and the thermoplastic material is therefore placed at progressively higher positive or negative potentials.

3,821,723
DATA STORAGE CIRCUIT

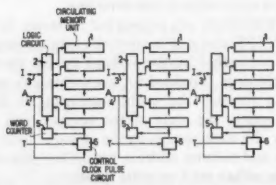
Friedrich Klein, Rothenbach/Peg, and Peter Kageler, Nurnberg, both of Germany, assignors to Firma DIEHL, Nunberg, Germany

Filed June 1, 1973, Ser. No. 366,110

Claims priority, application Germany, June 2, 1972, 2226991

Int. Cl. G11c *21/00*

U.S. Cl. 340—173 RC **8 Claims**



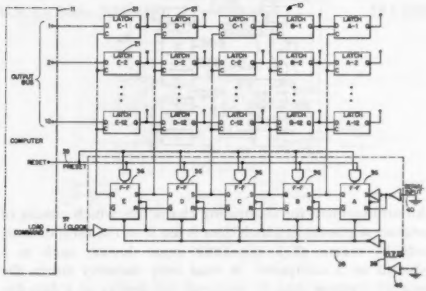
A data storage circuit including a plurality of data storage elements and a control circuit for providing address signals, information signals and basic clock pulses. A control clock

pulse circuit provides timing pulses to the data storage elements. The frequency of the timing pulses coupled to the data storage elements will be varied such that only those data storage elements which are currently being addressed are operated at the frequency of the basic clock pulses while those data storage elements which are not being addressed are operated by second clock pulses at a lower frequency.

3,821,724
TEMPORARY STORAGE APPARATUS

Philip C. Warner, Sharon, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 12, 1973, Ser. No. 378,717
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **5 Claims**



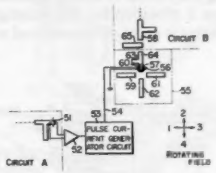
Apparatus for temporarily storing a series of five 12-bit words which are received in series word, parallel bit format. The data bits are stored in an array of 60 latches arranged in 12 rows by 5 columns. The data input of each latch is connected to the output of the latch in the same row in the preceding column. The data bits are applied at the data input of the latches in the first column. The outputs of each stage of a 5-stage shift register are connected in reverse order from last to first to the clock inputs of all the latches of each column in succession from first to last. The 12 bits of a word are passed along the 12 rows of latches and become stored in the latches of the column of highest order in the succession not having data bits already stored therein by a change in the level at the clock inputs to the latches of that column caused by triggering of the stage of the shift register connected thereto. During the presence of each of the five words the next untriggered stage of the shift register in succession is triggered so that after receipt of five words the array of latches contain all the bits of the five 12-bit words of the series.

3,821,725
MAGNETIC DOMAIN CIRCUIT ARRANGEMENT

Yuzo Kita; Fumiyuki Inose; Noriyuki Homma, all of Kokubunji, and Michio Yasuda, Koganei, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Sept. 15, 1972, Ser. No. 289,210
Claims priority, application Japan, Sept. 19, 1971, 46-72784
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF **10 Claims**

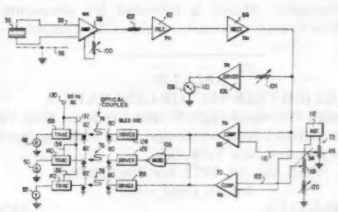
A magnetic domain circuit arrangement wherein the first group of magnetic material patterns (the first magnetic domain circuit) and the second groups of magnetic material patterns (the second magnetic domain circuits) are connected by electric conductor, the first pattern group being formed by providing by evaporation a number of thin high-permeability films of, e.g., permalloy and with the shapes of T-bar, Y-bar etc. on a substrate for magnetic bubbles, the second pattern groups being located at mutually spaced positions within the same substrate as that of the first pattern group, and wherein magnetic bubble-detecting means and current supply means are provided at one end of said electric conductor, while magnetic bubble-generating means is disposed at the other end, whereby in case where a bubble is detected at a predetermined position in said first group of magnetic material patterns, a current flowing through said electric conductor is supplied by the detection output thereof, so as to generate bubbles at predetermined positions in said second groups of magnetic material patterns. Since, with such arrangement, a number of magnetic domain circuits existing at long distances from one another can be easily connected, a complicated logical circuit such as a 1 (input)-to-*n* (inputs) logical sum and logical product circuit can be constructed.



3,821,726
BLOW-OUT SENSOR

Nuke Ming Chang, San Francisco; I. J. Flowers, Yorba Linda, and Gordon M. Anderson, Fullerton, all of Calif., assignors to Santa Fe International Corporation, Orange, Calif.

Filed May 8, 1972, Ser. No. 250,919
Int. Cl. G08b *21/00*
U.S. Cl. 340—239 R **8 Claims**



A device for sensing an impending blowout or so-called "kick" in an oil well. A vibration detector is attached to the drilling fluid supply and return pipes to sense the amount of flow through them. The volume flow of drilling fluid (mud) through the pipes is directly proportional to the power level of the electrical signal at ultrasonic frequencies above about 20KHz. An excessive increase or decrease in flow through either pipe is used to indicate the likelihood of a "kick."

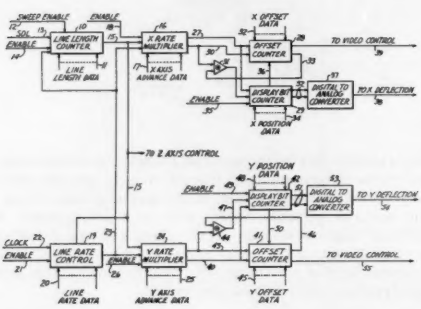
3,821,727
DIGITAL DISPLAY GENERATORS

Fred W. Erickson, Northridge, and John G. Price, Granada Hills, both of Calif., assignors to Litton Systems Inc., Beverly Hills, Calif.

Filed Apr. 27, 1972, Ser. No. 248,042
Int. Cl. G08b *5/36*
U.S. Cl. 340—324 A **22 Claims**

A digital display generator generates deflection signals for operating on the deflection circuitry of a display device to move a visual representation, such as a spot generated by the

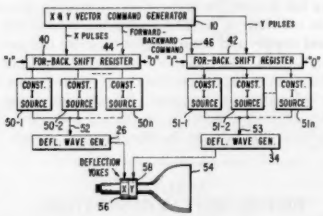
display device, along X and Y axes. A pulse generator is provided to produce pulses at rates representative of the desired rates of movement of the spot in X and Y directions, and counter means is provided for establishing a count representative of the position of the spot along the X and Y axes. Control means is provided for selectively increasing or decreasing the count in the counter means in accordance with the intended direction along the X and Y axes, and converter means is provided for converting the counts to analog signals. Preferably, offset counter means is provided for determining whether or not the intended display is on or off screen, and means is provided for stepping the offset counter in such a manner that when the intended display reaches the region of the screen, the display device is operated to generate the visual representation. In accordance with one aspect of the present invention, a character display generator is provided having storage means containing data relating to each of a plurality of strokes for each of a plurality of characters, and means is provided for addressing the storage means whereby a stroke generator will generate digital signals representative of each stroke of a selected character. Means is provided for advancing the storage means to each successive stroke of the character.



3,821,728
GLICH FREE VECTOR GENERATION

Kazuo Katagi, Woodland Hills; Walter Lee Ross, Simi Valley, and John Jeffrey Lyon, Northridge, all of Calif., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 14, 1972, Ser. No. 280,096
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A **3 Claims**

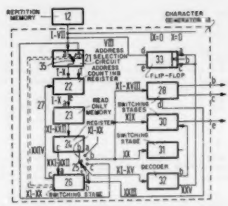


Two groups of serially occuring pulses, indicative of the lengths of the two components of a vector, are employed to shift binary ones into or remove them from two forward-backward shift registers. Each stored binary one is translated to an increment of current of unit magnitude. The deflection voltages for producing a vector are obtained by summing the unit current increments derived from each register.

3,821,729
ARRANGEMENT FOR CONTROLLING THE ORIENTATION OF CHARACTERS ON A DISPLAY DEVICE UTILIZING ANGLE DEFINING DATA SYLLABLES AND DATA ADDITION FOR SUCH SYLLABLES

Manfred Schultze, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Mar. 9, 1973, Ser. No. 339,565
Claims priority, application Germany, Mar. 24, 1972, 2214585
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A **6 Claims**

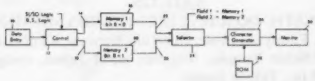


An arrangement for illustrating characters which consist of character segments in which data is fed in in the form of code words by means of a character input device, such as a keyboard or a computer. A read only memory stores the character segment data for retrieval and display on a data display device via digital/analog converters and a deflection unit which causes deflection of a character creating element, such as an electron beam, in accordance with the character segment data. An adder is connected to the read only memory and is fed syllables of the character segment data corresponding to angles by which the character to be illustrated is to be disposed with respect to a coordinate system or with respect to a character segment. The adder feeds the digital/analog converters by way of register and decoding apparatus.

3,821,730
METHOD AND APPARATUS FOR DISPLAYING INFORMATION ON THE SCREEN OF A MONITOR

Peter Majendie Carey, Beaconsfield, and Courtney Lai-Hing, Pointe Claire, Quebec, both of Canada, assignors to Lektromedia Ltd., Pointe Claire, Quebec, Canada

Filed June 14, 1973, Ser. No. 369,872
Int. Cl. G06f 3/14
U.S. Cl. 340—324 AD **30 Claims**



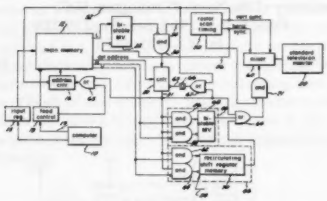
A method and apparatus for displaying information on the screen of a monitor which permits the simultaneous display of a first character and a second character in a single raster location on the screen of a monitor, and hence the overstriking or modifying of a first character with a second character in a single raster location on the monitor. In one form of the invention which involves a field sequential operation, a character generator will permit the alternate display of information from two separate memories in a single raster location by super-imposition of the characters in the raster location on the monitor. In another form of the present invention, involving line-

sequential operation, a pair of character generators are employed and each operate in conjunction with each of a pair of memories and the characters thus generated in each character generator is combined in a mixer and displayed in the superimposed fashion on the screen of a monitor.

3,821,731
GRAPHICS DISPLAY SYSTEM AND METHOD

Michael Robert Levine, Ann Arbor, Mich., assignor to Ann Arbor Terminals, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 150,288, June 7, 1971, abandoned. This application July 23, 1973, Ser. No. 381,577
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 AD **19 Claims**



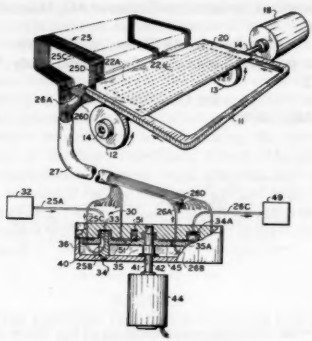
A system for displaying on a standard television monitor a horizontal line along a scan line or a vertical line orthogonal to the scan line wherein coded digital signals from a memory define the location of the starting point of the line and also identify the line as either a horizontal or a vertical line. For horizontal line drawing, circuit means are provided to respond to the starting point identification to gate the beam on and to the horizontal line identification to maintain the beam gated on along a scan line until the end of the line. For vertical line drawing, the beam is gated on at the starting point and a recirculating shift register stores the starting point identification to gate the beam on at the corresponding positions in successive scan lines.

3,821,732
APPARATUS AND METHOD FOR PRODUCING, COMMUTATING AND TRANSMITTING OPTICAL AND ELECTRONIC SIGNALS

Russell H. Romney, 3259 Bon View Dr., Salt Lake City, Utah 84109

Continuation-in-part of Ser. No. 38,382, May 18, 1970, Pat. No. 3,656,157. This application May 14, 1971, Ser. No. 143,398
Int. Cl. G08b *5/00*
U.S. Cl. 340—380 **19 Claims**

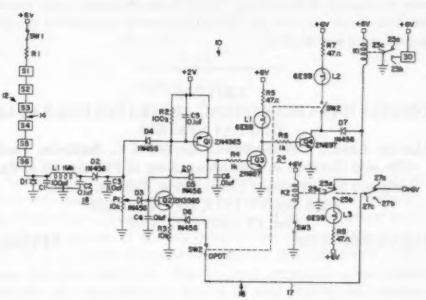
Electronic signals, e.g., in the form of light beams, are produced. These are sequenced or commutated and transmitted through optical fibers arranged singly, in groups, or in systems of sub-groups. Means are provided to scan, select and transmit illumination, selective data, or analogous bits or continua of energy. Control means include a reversible motor driving commutator elements which are geared and grouped together. These serve to connect selected light fibers, singly or in groups, to a light source and/or to a light sensor, for reading data cards, for scanning areas or objects systematically, including anatomical organs or parts, or for displaying information, guiding human or mechanical operators in selection and/or placement for assembly of small mechanical parts, and analogous functions.



3,821,733
ALARM CIRCUITRY

Martin H. Reiss, Newton, and James R. Adams, Framingham, both of Mass., assignors to Gulf & Western Manufacturing Company (Systems), New York, N.Y.

Filed June 15, 1971, Ser. No. 153,297
Int. Cl. G08b *13/00*
U.S. Cl. 340—409 **10 Claims**



The alarm circuitry employs a plurality of pressure responsive sensors interconnected by conductor means to detection circuitry including an alarm relay, display panel, or other alarm indicating means. One sensor may be associated with each door, window or other entrance means of the protected premises and all sensors are preferably closed when the premises are secured. In one embodiment the sensors are coupled in series and the detection circuitry is voltage responsive, while in another embodiment the sensors are coupled in parallel and the detection circuitry is current responsive. In both embodiments the detection circuitry senses an alarm condition when a sensor is activated or when the conductor means becomes open or short circuited. In addition, the detection circuitry includes one or more test switches actuable by an authorized person prior to leaving the premises to determine if all entrance means are in a safe closed position, and to check the operability of the alarm circuitry itself prior to enabling it for possible energization by an unauthorized person.

3,821,734
FIRE ALARM SYSTEM WITH REMOTE CENTRAL STATION

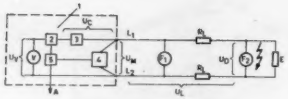
Otto Meier Herrliberg, and Andreas Scheidweiler, Stafa, both of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Filed June 28, 1973, Ser. No. 374,795

Claims priority, application Switzerland, July 17, 1972, 10654/72

Int. Cl. G08b *17/10*

U.S. Cl. 340—409 **14 Claims**



To provide unambiguous indication of fire alarm conditions in a central station, in which a plurality of fire alarm sensing lines come together, to which sensors are connected which, in case of fire, have low electrical resistance, the central has a current limiter which limits the current in case an alarm is sensed to a first limited value (I_m), the predetermined current being selected with respect to the alarm sensors such that, until the limiting current is reached, the electrical resistance of the sensor is higher than a predetermined value and, when the predetermined current has been reached, the electrical resistance drops below that resistance value; the signal central further having a voltage sensor to sense voltage drop at the connection point of the lines leading to the sensors which, when an excessive voltage drop across a certain line is sensed at the predetermined current value (I_m) further causes transmission of a higher current than the predetermined current(I_m), at least for a limited period of time, in order to be able to clearly differentiate between alarm conditions, possible line short circuits or interruptions, or non-alarm conditions during line trouble.

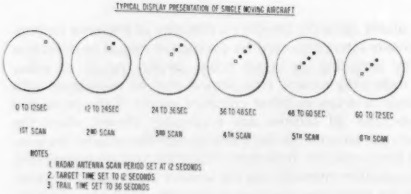
3,821,735
DIGITAL DATA REFRESHING APPARATUS FOR RADAR DISPLAY SYSTEM

Murray Lasoff, Downingtown; Raymond C. Baldwin, Lionville, and Herman B. Natanblut, King of Prussia, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 29, 1973, Ser. No. 327,687

Int. Cl. G01s *7/22, 9/02*

U.S. Cl. 343—5 DP **13 Claims**



In an air traffic control system, real-time digitized radar target data is stored in a virtual pushdown stack memory and is repetitively fed to a CRT display system at a rate sufficient to generate a steady flicker-free display. Identification of the data to be displayed as either that derived and stored during the radar antenna's most recent scan or that generated by past scans provides the option of displaying a target's current position by one indicium and its past positions by other indicia whereby a moving target may be displayed as a small symbol followed by a selectable number of trailing dots thereby allowing the observer to readily assess the target's current position, its heading, and by noting the spacing of the dots, its speed. By allocating memory space to the most recent data and discarding the oldest data, graceful degradation occurs in target data overload situations whereby the lost data effects merely a reduction in the number of trailing dots per target.

ERRATA

For Classes 343—5 and 343—7 see:
Patents Nos. 3,821,751 and 3,821,752

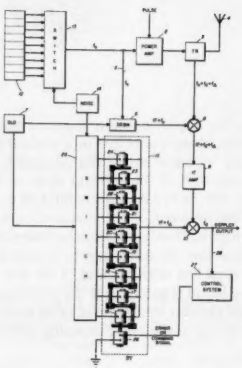
3,821,736
FREQUENCY DIVERSITY PULSE DOPPLER RADAR

John H. Kuck, and Donal B. Staake, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 5, 1962, Ser. No. 229,289

Int. Cl. G01s *9/26*

U.S. Cl. 343—7.7 **18 Claims**

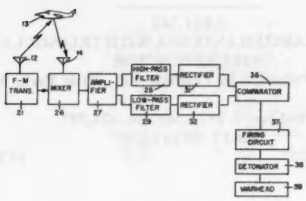


4. A frequency diversity pulse Doppler radar system comprising a directive antenna, transmitting means for providing a plurality of signals of different fixed frequencies connected to said antenna so as to generate exploratory pulses of electromagnetic energy, a stable local oscillator, modulating means connected to said transmitting means and said local oscillator for providing a timing reference signal, a first mixer connected to said modulator and said antenna for combining said timing reference signal and a target echo signal to produce a carrier Doppler signal, a second mixer connected to said first mixer and said local oscillator for detecting the Doppler portion of said target echo signal, a plurality of mechanical phase shifters having their outputs connected to said second mixer, a first switch means connected to each of said mechanical phase shifters and to said local oscillator for selectively connecting said oscillator to one of said mechanical phase shifters, and a control means for driving each phase shifter at a continuously varying speed until a proper Doppler signal is detected by said second mixer and for driving each phase shifter at a speed equal to the frequency of the Doppler ambiguity produced by a corresponding transmitted frequency after a proper Doppler signal is detected by said second mixer.

3,821,737
RATIO FUZE

Henry P. Kalmus, 3255 O St. N.W., Washington, D.C. 20007

Filed Feb. 17, 1955, Ser. No. 489,005
Int. Cl. G01s 9/24
U.S. Cl. 343—7 PF 8 Claims

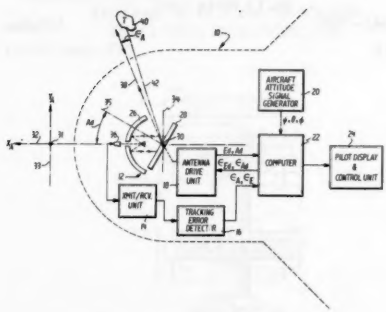


6. In an electronic ordnance fuze of the class wherein the signal returned from a target is mixed with a portion of the transmitted signal to obtain a mixer output signal the energy of which is peaked at a frequency substantially proportional to fuze-to-target distance, the improvement comprising: first and second networks having different but overlapping pass bands, the inputs of both of said networks being connected to the output of said mixer; and a firing circuit responsive to the attainment of a predetermined ratio between the respective outputs of said networks.

3,821,738
ANTENNA POSITIONING SYSTEM AND METHOD

Elmen C. Quesinberry, Severna Park; Clarence C. Glover, Baltimore, and Brewton O. Van Hook, Ellicott City, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 31, 1972, Ser. No. 276,344
Int. Cl. G01s 9/22
U.S. Cl. 343—7.4 50 Claims

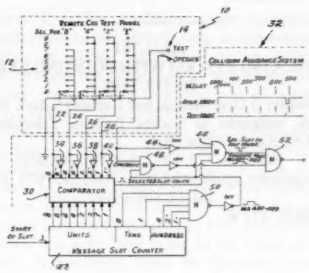


A system for positioning an antenna of a tracking radar system, particularly of the type employing a driven beam reflector of the type utilized in a cassegrain antenna system, without the use of rate gyros. A target line-of-sight error signal representing the error between the radar beam line-of-sight and the target line-of-sight in a line-of-sight coordinate system is generated and then referenced to a fixed coordinate system. In a radar system employing an antenna having an axis system corresponding to the beam line-of-sight axis system, the line-of-sight error signal is referenced to the fixed coordinate system by first referencing the error signal to an aircraft axis system and then to the fixed coordinate system to obtain a fixed coordinate referenced error signal. The fixed coordinate referenced line-of-sight error signal may then be employed to generate fixed coordinate referenced line-of-sight error rate and position signals through the use of a predetermined transfer function and an integrator having a predetermined, fixed coordinate system referenced constant of integration. The line-of-sight position signals referenced to the fixed coordinate system may then be used to generate antenna angular pointing error signals which may be used to drive the antenna in a direction tending to null the line-of-sight error signal. In a system employing a driven beam reflecting element such as in a cassegrain system, the rotation affect of the reflector on the beam is taken into account in referencing the line-of-sight error signals to the fixed coordinate system. Moreover, the complex relationship between beam position and reflector position is accounted for in transforming to and from the fixed coordinate system. A method and system for generating line-of-sight angular rate signals for use in fire control systems is also disclosed.

3,821,739
MEANS FOR TESTING THE OPERATION OF COLLISION AVOIDANCE SYSTEMS

Wilbur H. Von Fange, Kirkwood, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed July 6, 1971, Ser. No. 159,758
Int. Cl. G06g 7/78
U.S. Cl. 343—17.7 15 Claims



An apparatus for improving the testing of synchronized collision avoidance equipment including apparatus for simplifying obtaining a synchronized condition of the equipment being tested and apparatus making possible the selection for evaluation of a plurality of individual sets of simulated test conditions for test purposes. The present apparatus also makes possible the simultaneous testing of any number of collision avoidance systems within line-of-sight range of the test apparatus.

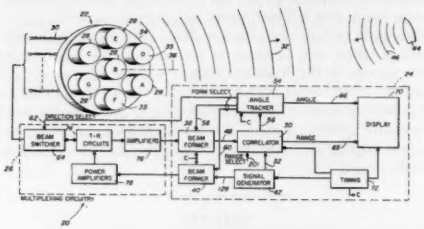
3,821,740
SUPER-DIRECTIVE SYSTEM

Stanley L. Ehrlich, Middletown, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed July 3, 1972, Ser. No. 268,416
Int. Cl. G01s 3/74; H04b 7/04
U.S. Cl. 343—100 SA 1 Claim

A system of radiating elements arranged for forming one or more beams of radiation having radiation patterns such as a monopole, dipole, quadrupole, other multipoles or combination thereof. The individual radiating elements of the array are interconnected by circuitry providing for the summing and differencing of signals provided by adjacent radiating elements in response to incident radiation. In one embodiment the signal of one radiating element is delayed relative to the

signal of an adjacent radiating element. The differencing of the signals provides for the deep nulls found in radiation patterns such as the dipole and quadrupole radiation patterns, while the delay between signals of adjacent radiating elements is adjusted for varying the shape of the directivity pattern. The system provides for varying the direction and shape of beams of the radiation pattern to provide for the detection, classification and/or tracking of a distant source of radiation as well as for illuminating a distant object. The system is responsive to the intensity of radiation received along one or more beams of the radiation pattern, and in response thereto, varies the delay between the signals of adjacent radiating elements and also provides for the selective coupling of specific radiating elements of the system.

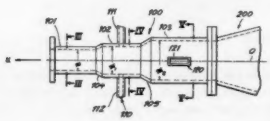


3,821,741

TRACKING SYSTEM WITH POINTING ERROR DETECTOR

Enzo Cavalieri D'Oro, Monza, and Luciano Salari, Milan, both of Italy, assignors to Societa Italiana Telecomunicazioni SIEMENS S.p.A., Milan, Italy

Filed Nov. 22, 1972, Ser. No. 308,850
Claims priority, application Italy, Nov. 24, 1971, 31579/71
Int. Cl. G01s *3/42*
U.S. Cl. 343—117 R **6 Claims**



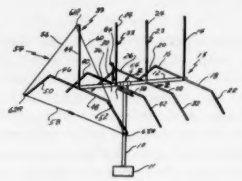
A tracking system, e.g. for following the course of a communications satellite, has a horn-reflector antenna working into a generally cylindrical coupler with three axially spaced circular waveguide sections interconnected by frustoconical transition sections, i.e. a large-diameter section propagating the dominant mode TE^{o}_{11} and two higher modes TM^{o}_{01}, TE^{o}_{21}, an intermediate-diameter section propagating only the TE^{o}_{11} and TM^{o}_{01} modes, and a small-diameter section cutting off all except the TE^{o}_{11} mode. The two higher modes TM^{o}_{01} and TE^{o}_{21}, coming into existence only when the incoming beacon wave is disaligned with the horn axis, provide a measure of the pointing error the antenna; for correcting this disalignment, a first error signal corresponding to the TM^{o}_{01} mode is extracted from the intermediate-diameter waveguide section by a first pair of diametrically opposite rectangular waveguide branches with major sides transverse to the cylinder axis whereas a second error signal corresponding to the TE^{o}_{21} mode is extracted from the large-diameter waveguide section by a second pair of diametrically opposite rectangular waveguide branches, offset from the first pair by 90°, whose major sides are parallel to the cylinder axis. The two error signals are isolated by additively combining the outputs of the first pair of rectangular waveguide branches and subtractively combining the outputs of the second pair of rectangular waveguide branches with the aid of a first and a second magic T, respectively, working together into a third magic T whose summing and differential outputs deliver corrective voltages to a controller for the antenna.

3,821,742

DUAL POLARIZED ANTENNA WITH TRIANGULAR WIRE REFLECTOR

Frederick J. Pollard, 120 Leighton Rd., Hyde Park, Mass. 02136

Filed Jan. 5, 1973, Ser. No. 321,397
Int. Cl. H01q *21/00*
U.S. Cl. 343—727 **4 Claims**



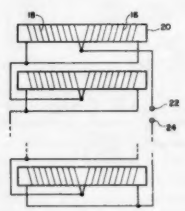
A citizens band antenna has two or more units made up of horizontal, vertical and twin duty elements supported by a mast and a boom, at the rear of which is a triangular reflector connected at the rear of the antenna to the nearest array.

3,821,743

FERRITE LOOPSTICK ANTENNA ARRAYS FOR LORAN-C RECEIVER

Kurt Ikrath, 232 Lockwood Ave., Elberon, N.J. 07740

Filed June 12, 1973, Ser. No. 369,326
Int. Cl. H01q *7/08*
U.S. Cl. 343—748 **3 Claims**



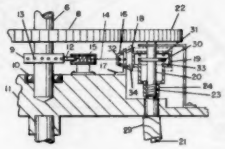
The traditional whip antenna of a loran-C receiver is replaced by an antenna of one or preferably two ferrite loopstick arrays. Each array includes several identical loopsticks, each of which support equal left-hand and right-hand coils connected in parallel. The parallel-connected left-hand and right-hand coils of the loopsticks of each array are connected in series. In each array, the loopsticks are supported with their axes parallel and coplanar and with their ends in-line. The loopstick axes of each array are horizontal and one above the other when the receiver is in use. The arrays are spaced a short distance, are at an angle to each other laterally and are independently adjustable in azimuth for directivity. Each array has an effective height greater than that of the whip antenna it replaces.

3,821,744

MANUALLY ROTATED ANTENNAE UTILIZING A FLEXIBLE CABLE AND A PIN LOCKING MECHANISM

Thomas S. Briley, 5218 Revere Rd., Durham, N.C. 27707

Filed Sept. 13, 1971, Ser. No. 179,835
Int. Cl. H01q 3/02; G05g 5/06
U.S. Cl. 343—763 5 Claims



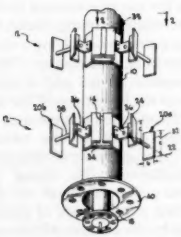
This invention consists of an antenna supported by a vertically disposed shaft. The lower portion of the shaft extends through a hub and bearing that is integrally formed with the apex of the antenna shaft support and mechanism housing. The mechanism that rotates the aforesaid antenna comprises two horizontally disposed gears in mesh with one another. The lower portion of the antenna supporting shaft passes down through and is secured to the center of the largest of the two gears, the shaft being provided with a locking collar that is adapted to spring-loaded mechanism activated by mechanism connected to the upper end of a flexible shaft that terminates in and is secured to the center of the second of the two aforesaid gears, the second gear being smaller in diameter than the first mentioned gear. The lower end of the aforesaid flexible shaft is secured to a hand wheel that rotates the aforesaid antenna by means of this mechanism, as will hereinafter be described.

3,821,745

TRANSMITTING ANTENNA EMPLOYING PARASITIC END-FIRE DIRECTORS

Richard D. Bogner, Roslyn, N.Y., assignor to CCA Electronics, Gloucester City, N.J.

Filed Aug. 30, 1971, Ser. No. 175,999
Int. Cl. H01q 13/10, 19/00, 1/12
U.S. Cl. 343—770 14 Claims



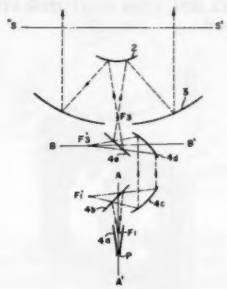
A transmitting antenna assembly comprises elementary driven antenna elements and end-fire directors on a conventional supporting structure to obtain an omnidirectional or other desired antenna pattern, even for supporting structures of relatively large transverse dimensions. The end-fire directors employ one or more conductive members wherein one portion of the member is transverse to the director axis and another portion thereof is bent at a substantial angle from its normal transverse position.

3,821,746

ANTENNA SYSTEM WITH DISTORTION COMPENSATING REFLECTORS

Motoo Mizusawa, Janajyra; Yoshihiro Takeichi, Kamakura, and Shinichi Betsudan, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1972, Ser. No. 303,049
Claims priority, application Japan, Nov. 17, 1971, 46-92210; Nov. 17, 1971, 46-92211
Int. Cl. H01q 19/14
U.S. Cl. 343—781 5 Claims



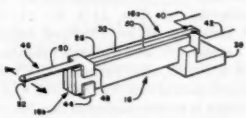
An antenna system has a reflector system comprising a plurality of reflectors having rotationally asymmetrical curved surfaces such as elliptic, hyperbolic or parabolic surface geometries. In order to compensate for the asymmetrical properties of the reflectors, at least one pair of asymmetrical reflectors is arranged in facing relationship so that the differences in asymmetrical properties are compensated by the opposite radiation distribution characteristics of each reflector. The reflectors are positioned apart so that among the reflectors the ratio between the product of the distances from each reflection point of each reflector to the focus of each reflected beam forms a constant ratio with the product of the distances from the reflection point to the focus of each incident beam. Accordingly, when an electromagnetic beam source with a rotationally symmetrical beam, is applied, a rotationally symmetrical radiation distribution characteristic results at an aperture of the antenna system even though the reflectors have rotationally asymmetrical curved surfaces.

3,821,747

RECORDING SYSTEM HAVING PIEZOELECTRIC STYLUS DRIVE MEANS

Harry Mason, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Apr. 23, 1973, Ser. No. 353,254
Int. Cl. G01d 9/32
U.S. Cl. 346—62 1 Claim



A recording system is described which utilizes one or more elongated multilayer piezoelectric elements supported adjacent one end with other end free for sideways bending move-

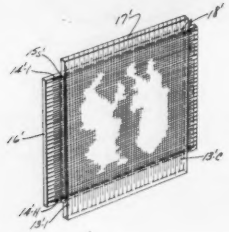
ments, and carrying a stylus at the free end, with a recorder medium in contact with the stylus and relatively movable one with respect to the other, and means for selectively vibrating the multilayer element by oscillating electrical signals which are proportional to the information which is to be recorded.

3,821,748

RECORDING OF INFORMATION FROM GASEOUS DISCHARGE DISPLAY/MEMORY PANEL

Felix H. Brown, East Lansing, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 23, 1970, Ser. No. 101,102
Int. Cl. H01j *17/48, 61/33;* **H05b** *41/44*
U.S. Cl. 346—74 P **12 Claims**



There is disclosed the generating and recording of image information from a multiple gaseous discharge display/memory panel having an electrical memory and capable of simultaneously producing information in the form of a visual or latent image, the panel being further characterized by an ionizable gaseous medium in a gas chamber formed by a pair of opposed dielectric material charge storage members which are respectively backed by a series of parallel-like conductor (electrode) members, the conductor members behind each dielectric material member being transversely oriented with respect to the conductor members behind the opposing dielectric material member so as to define a plurality of discrete discharge volumes, each of which constitutes a discharge unit, the visual or latent image being comprised of one or more discharge units, and image radiation from the discharge units being projected onto a photosensitive surface adapted to receive and record the image. The projected image radiation may be visible or latent (invisible) relative to the human eye.

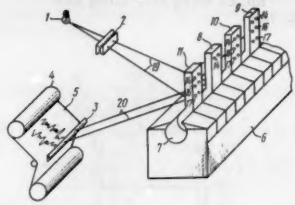
3,821,749

LIGHT-BEAM OSCILLOGRAPH

Oleg Semenovich Andreev, ul. Tolbukhina 22, kv. 5; Boris Konstantinovich Birjukov, ul. Dimo, 14, kv. 45; Yury Mikhailovich Byzov, ul. Dmitrova, 16, kv. 120; Moisei Abramovich Lekhtman, ul. Pugacheva, 53, kv. 60; Azik Iosifovich Perelberg, ul. Pushkina, 16, kv. 12; Semen Itskhovich Strimbling, ul. Benderskaya, 55, kv. 14; Boris Sergeevich Trachevsky, ul. Roz, 31/2, kv. 11; Isak Berovich Fikhman, ul. Pirogova, 44, kv. 17; Pavel Andreevich Cherepakha, per. Zerkalny, 7, and Tamara Yakovlevna Shraifeld, ul. Florilor, 8/4, kv. 40, all of Kishinev, U.S.S.R.

Continuation-in-part of Ser. No. 300,312, Oct. 24, 1972, abandoned, which is a continuation of Ser. No. 92,403, Nov. 24, 1970, abandoned. This application Sept. 21, 1973, Ser. No. 399,441
Int. Cl. G01d *5/12*
U.S. Cl. 346—109 **1 Claim**

A light-beam oscillograph having a magnetic block the sockets of which incorporate oscillograph galvanometers and at least one galvanometer-transducer having a mirror output directly coupled to an optical system and a chart drive means



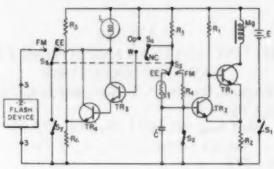
wherein an information recording medium records the result of transformation of at least one signal being investigated.

3,821,750

INDICATING CIRCUIT FOR CAMERA VISUALLY INDICATING NEED FOR FLASH EXPOSURES AND PERIODS OF THE EXPOSURES

Takeshi Murakami; Yukio Nakamura, both of Chiba; Eiichi Onda, Saitama, and Yukio Morino, Tokyo, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 231,697, March 3, 1972, abandoned. This application Sept. 4, 1973, Ser. No. 393,840
Claims priority, application Japan, Mar. 4, 1971, 46-11145
Int. Cl. G03b *7/08*
U.S. Cl. 95—10 CE **3 Claims**



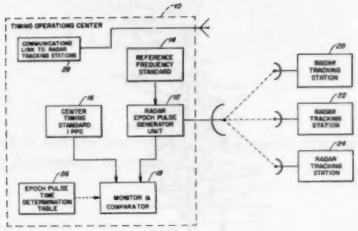
A control circuit for use in a camera having an electrically operated shutter including a timing circuit that automatically controls the exposure time by applying a switching signal to a switching circuit that closes the shutter. The timing circuit includes a light-responsive device and develops the switching signal as a function of the brightness of the scene being photographed. A manually operated change-over switch selectively connects the timing circuit to the switching circuit for establishing a time exposure mode of operation for taking time exposures and disconnects the timing circuit from the switching circuit and connects a flash circuit into the control circuit for establishing a flash mode of operation. A connecting switch, actuated by the camera release, connects the light-responsive device to a warning and indicating circuit. When the change-over switch is set for the time exposure mode the light-responsive device applies a bias signal to a warning and indicating circuit which emits a warning signal to warn the camera user that there is insufficient light and that the flash mode of operation is necessary. A synchro-switch in the flash circuit, actuated by the release lever of the camera, is closed when the shutter is opened and is opened as the shutter closes. It controls the ignition of the flash device when the change-over switch is set for the flash mode, and controls the emission of the warning signal during the time the shutter is open, when the change-over switch is set for the time exposure mode.

3,821,751

METHOD FOR WORLD WIDE SYNCHRONIZATION OF TRACKING RADARS

John C. Loos, Santa Monica, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1972, Ser. No. 238,651
Int. Cl. G01s 9/02
U.S. Cl. 343—5 R 8 Claims



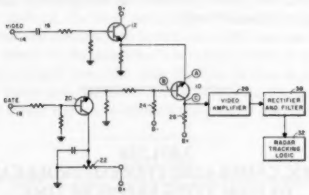
A system and method for accurately synchronizing a plurality of radar stations which are tracking the same target. The system provides a very accurate frequency standard from which epoch, i.e., "on-time", pulses can be determined. With this information accurately maintained, computer analysis can provide the proper offset from epoch time which will prevent interference or beacon stealing at acquisition. Monitoring of a radar station's transmission provides information from which PRF occurrence can be advanced or retarded to also eliminate beacon stealing.

3,821,752

ELECTRONIC INTERFERENCE DETECTOR FOR RANGE-TRACKING PULSE RADAR SYSTEMS

James F. McKelvey, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 31, 1966, Ser. No. 576,785
Int. Cl. G01s 9/14, 7/36
U.S. Cl. 343—7.3 2 Claims



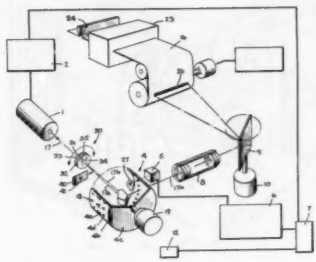
An electronic interference detector which utilizes the minimum video amplitude at target return time as the criterian for detector action. In radar operation this will insure that the detector threshold will be directly related to the effective noise-to-signal ratio so that the detector threshold can be set at a value such that the radar tracking modes will be altered only when necessary.

3,821,753

MULTIFONT PHOTOCOMPOSING MECHANISM

David J. Sinnott, Ringwood, and Donald E. Alecci, Pine Brook, both of N.J., assignors to Star-New Era, Inc., South Hackensack, N.J.

Filed July 5, 1972, Ser. No. 269,196
Int. Cl. B41b 21/28
U.S. Cl. 95—4.5 18 Claims



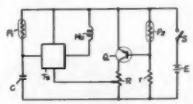
The use of an optical wedge for directing the beams of a photocomposing machine from one font to another by moving the wedge and masking means to limit the optical field.

3,821,754

EXPOSURE TIME CONTROLS FOR CAMERAS

Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 2, 1971, Ser. No. 167,966
Claims priority, application Japan, Aug. 8, 1970, 45-69364
Int. Cl. G03b 7/08, 9/62
U.S. Cl. 354—24 10 Claims



An electrical system for automatically determining, in cameras, exposure time, particularly under low-light conditions. The system includes an RC circuit made up of a photoconductor and capacitor connected in series, a trigger circuit connected to the RC circuit to be triggered thereby when a given trigger level is reached and a structure responding to triggering of the trigger circuit for initiating an exposure-terminating operation. The photoconductor, the capacitor, and the trigger circuit form three units to any one of which a compensating circuit is electrically connected for the purpose of automatically increasing the exposure time under low-light conditions, so as to compensate in this way for photographs which are made when relatively little light is available.

3,821,755

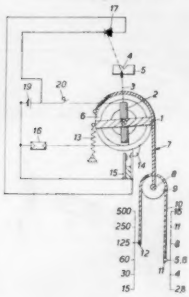
PHOTOGRAPHIC CAMERA

Heinz Schulze, Dresden, Germany, assignor to VEB PENTACON DRESDEN Kamera-und Kinowerke, Dresden, Germany

Filed May 3, 1973, Ser. No. 357,014
Claims priority, application Germany, Nov. 9, 1972, 0316675
Int. Cl. G03b 7/04
U.S. Cl. 354—24 4 Claims

A camera comprises a galvanometer rotatably mounted in the camera housing. The moving coil of the galvanometer is

provided with a pointer which is visible through a window in the housing and is adjustable in relation to a fixed mark also visible in the window. The galvanometer is movable bodily, against a spring attached to the outside of the magnet yoke, by diaphragm aperture and/or exposure time setting members. A



current source for the galvanometer also serves to illuminate a light source in circuit with a switch. Also attached to the yoke is a cam which closes the switch at the moment of entry of the non-deflected pointer into the window so that the light source will indicate adverse light conditions.

3,821,756

SHUTTER RELEASE MECHANISM WITH CHANGE-OVER DEVICE FOR FLASH PHOTOGRAPHY

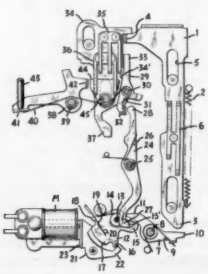
Kiyoshi Kitai, 54, Tomihisa-cho, Shinjuku-ku, Tokyo, Japan

Filed Oct. 2, 1970, Ser. No. 77,421

Claims priority, application Japan, Oct. 6, 1969, 44-79327

Int. Cl. G03b *15/03, 7/08*

U.S. Cl. 95—11 R **8 Claims**



A camera shutter release mechanism having a detector sensing and responsive to the mounting and removal of a flash device on a camera in which the shutter release mechanism is mounted. Automatic change-over means automatically change the shutter release mechanism among different modes of operation for taking a daylight exposure without use of a flash whether or not a flash device is mounted on the camera. If the brightness of the subject being photographed is adequate the flash device is not used and the exposure is taken without a flash. If the flash device is not mounted on the camera but yet brightness conditions require a flash exposure the mechanism automatically provides for a timed exposure. If the flash device is mounted and conditions require its use a flash exposure is accomplished by the change-over device in the shutter release mechanism.

3,821,757

CAMERA HAVING AN ELECTRIC SHUTTER

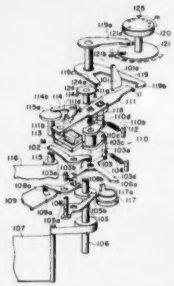
Toshio Kobori, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

Filed Mar. 15, 1972, Ser. No. 234,932

Claims priority, application Japan, Mar. 17, 1971, 46-18035[U]; July 21, 1971, 46-53902

Int. Cl. G03b *9/34*

U.S. Cl. 95—57 **5 Claims**



A shutter control apparatus of the type having leading and trailing members which are biased to move from respective cocked positions to respective rest positions for respectively initiating and terminating exposure, includes apparatus for selecting either automatic electric exposure or mechanical exposure control. The apparatus includes means for retaining the trailing member at its cocked position and means for moving the retaining structure to a retracted position when the leading member is moved from its cocked position to its rest position. Structure is also provided for restraining the retaining structure in its operating position and an electrical timing circuit controls the time period during which the restraining structure is operative. Locking structure locks the retaining structure in its retaining position and is released by a device which is responsive to the movement of the leading member from its cocked position to its rest position. The locking structure is maintained in an inoperative position when the apparatus is set to any one of a number of automatic exposure setting positions. The shutter control apparatus also is capable of carrying out bulb exposures either using a combined mechanical and electrical exposure control, or in a modified embodiment, the bulb exposure is completely effected by mechanical mechanism only.

3,821,758

ELECTRIC CAMERA SHUTTER CONTROLS CAPABLE OF INDICATING EXPOSURE TIME

Seinan Miyakawa, and Nobuhiro Noda, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Division of Ser. No. 251,761, May 9, 1972. This application Apr. 23, 1973, Ser. No. 353,885

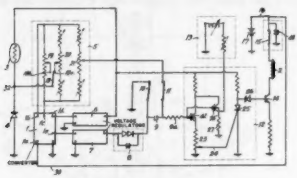
Claims priority, application Japan, May 12, 1971, 46-37319; May 13, 1971, 46-37735; May 21, 1971, 46-41155

Int. Cl. G03b *7/08*

U.S. Cl. 95—10 CT **1 Claim**

A camera capable of automatically determining the extent to which the film is exposed. The camera includes an indicator

which is available for indicating the exposure time to the operator in such a way that this indication does not in any way interfere with the functioning of the circuitry which automatically determines the exposure.

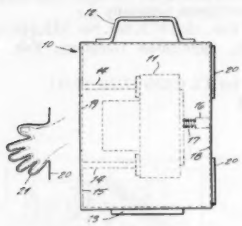


3,821,759

UNDER WATER CAMERA BOX

Frank Vooght, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Aug. 9, 1972, Ser. No. 278,949
Int. Cl. G03b *17/08*
U.S. Cl. 95—11 UW **1 Claim**



A waterproof box containing a photographic camera to permit it being submerged underwater for taking pictures beneath the water surface, the box consisting of a case having windows so to permit the camera lens to see out of the box, and the case having a panel on its side which is integral with a waterproof glove that extends inwardly into the box so that a person can place his hand into the glove and manipulate the camera adjustments inside the box without letting water enter.

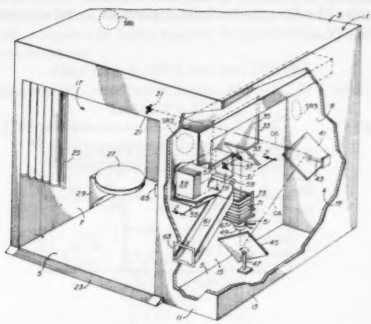
3,821,760

COMPACT AUTOMATIC PHOTOSTUDIO

C. Bruce Kennedy, and John F. Pasieka, both of Acton, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 8, 1973, Ser. No. 321,668
Int. Cl. G03b *17/50*
U.S. Cl. 95—14 **15 Claims**

An electronically controlled photostudio in which the user can take a self portrait with studio lighting. The apparatus includes a housing comprising a studio compartment containing a seat for the subject, and a set of strobe lights arranged in a desired portrait array. An apparatus compartment adjacent the studio compartment contains a camera, a set of mirrors defining a folded optical path through which the camera sees the head and shoulders of the user, and apparatus for automatically operating the camera to expose a film unit, and then processing the exposed film unit, when payment for the portrait is deposited by the subject. The finished portrait is presented at a slot in the wall of the housing.

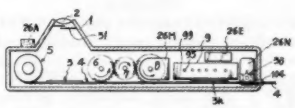


3,821,761

PHOTOGRAPHIC CAMERA WITH DEVELOPING MEANS

Masayoshi Hirashima, Ibaraki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma City, Osaka Prefecture, Japan

Filed Sept. 22, 1972, Ser. No. 291,356
Claims priority, application Japan, Sept. 27, 1971, 46-75679; Sept. 27, 1971, 46-75680; Oct. 3, 1971, 46-77305
Int. Cl. G03b *17/55*
U.S. Cl. 95—13 **9 Claims**



A photographic camera, having an optical system comprising an objective lens and a shutter, is provided with a built-in heating means for developing a thermo-developing photosensitive film or paper so as to develop a latent image formed by an exposure through the optical system, which heating means utilizes benzine or butane as fuel and is ignited for combustion by an electric heater or an electric spark.

3,821,762

PHOTOGRAPHIC EXPOSURE UNIT AND PROCESSING SYSTEM

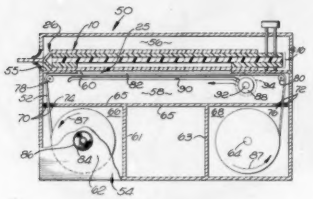
Richard A. Corrigan, Temple City, Calif., assignor to Bell & Howell Co., Chicago, Ill.

Filed July 23, 1973, Ser. No. 381,454
Int. Cl. G03b *17/52*
U.S. Cl. 95—13 **9 Claims**

A photographic processing system including a novel photographic medium packet. The packet comprises an inner pack having a photographic medium such as microfilm disposed in light-tight releasable sealing engagement between two protective layers of paper or the like, one of which has a light-transmitting window to permit exposure of the film. The pack is slideably disposed within a light-tight envelope and a portion

of the pack extends from an open end of the envelope. The opposite end of the envelope has a pull tab so that the envelope can be moved to expose the window, when desired.

For processing, the packet is releasably disposed within a processing unit including a compartment out of which the tab extends. The housing includes a separate compartment containing a monoweb bearing materials for developing the film. Upon pulling the tab to expose the window, the monoweb is guided into and out of contact with the film to effect development.



A novel photographic exposure and processing unit is provided adopted for a camera or the like.

3,821,763

ANNULAR FIELD OPTICAL IMAGING SYSTEM

Roderic M. Scott, Stamford, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 154,985, June 21, 1971, abandoned. This application Nov. 27, 1972, Ser. No. 309,642

Int. Cl. G03b *37/00*

U.S. Cl. 354—94 **8 Claims**

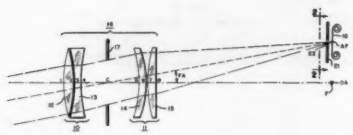


Image-forming optical systems (dioptric, catoptric or catadioptric) include rotationally symmetric image-forming elements, and apparatus selecting from the image of an extended object field formed thereby a portion having adequate image quality lying in a segment of an annular zone centered on the optical axis of those elements. Relative motion of the object field and image-forming elements permits recording the image of the entire object field.

3,821,764

ILLUMINATING APPARATUS

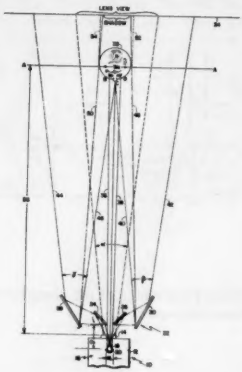
William A. Shelton, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1973, Ser. No. 320,449

Int. Cl. G03b *15/03*

U.S. Cl. 354—126 **29 Claims**

A lighting system for producing aesthetically natural and pleasing facial lighting for portrait photographs while eliminating objectionable background shadow. In its most basic form, the system utilizes a single source of artificial light and a light directing assembly for illuminating a subject in a specific manner to avoid shadows of the subject on a background within the field of view of an objective lens of a photographic camera.



3,821,765

PHOTOGRAPHIC ARRANGEMENT WITH VIEWFINDER INDICATION OF FLASH READINESS

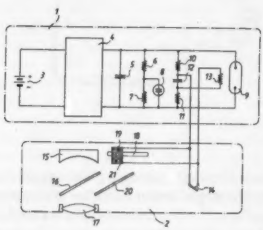
Karl Wagner, Ottobrunn, and Eduard Wagensonner, Ascheim, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 16, 1973, Ser. No. 333,149

Claims priority, application Germany, Feb. 24, 1972, 2208679

Int. Cl. G03b *17/20, 15/05*

U.S. Cl. 354—128 **4 Claims**



A liquid crystal element is connected in parallel with the release contacts of the camera which in turn are connected to the ignition circuit of the flash unit. The liquid crystal element is arranged in the camera housing and an image of it is reflected into the viewfinder. The liquid crystal changes from a light transmissive to an opaque state when the voltage across the ignition capacitor reaches the voltage required for flash initiation.

3,821,766

PHOTOGRAPHIC STUDIO LIGHTS

James W. Cowden, Aguanga, Calif. 92302

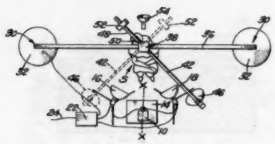
Filed Jan. 12, 1973, Ser. No. 323,201

Int. Cl. G03b *15/07*

U.S. Cl. 95—82 **3 Claims**

A photographic studio lighting system comprising a plurality of lights (preferably strobe lights) including two fill-in lights

arranged on opposite sides of the camera, and a main, or modeling light mounted on an overhead boom that is swingable about a vertical axis located directly above the subject. Other lights, such as hair high-light and background light, may also be included. A switch actuated by movement of the boom past the axis of the camera lens causes the fill-in light on the same side of the camera lens axis as the main light to be inactivated, and the fill-in light on the opposite side of the camera to be activated. Thus, when the main light is on the right-hand side of the subject, the fill-in light on the subject's left-hand side will be activated, and the fill-in light on the subject's right-hand side will be inactivated. Pressing the camera shutter release causes the overhead main light and the activated fill-in light to flash, as well as any other lights that are being used.



3,821,767

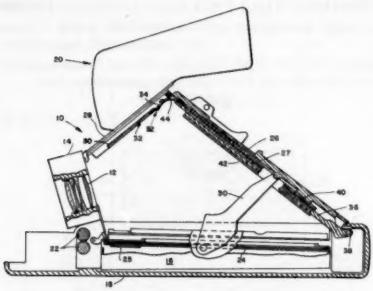
LIGHT SEAL FOR A REFLEX CAMERA VIEWFINDER

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 151,255, June 9, 1971. This application Sept. 29, 1972, Ser. No. 293,484

Int. Cl. G03b *19/12*

U.S. Cl. 95—42 **23 Claims**



A resilient flap prevents light from entering a reflex camera through a viewfinder during a photographic exposure. A film unit stored in the camera is covered by a capping plate, in its first position, during framing and focusing. When the shutter operates, the capping plate pivots about one end, into its second position, to uncover the film unit for an exposure. The resilient flap, extending from the free end of the capping plate, is swung to a position where it will block light which would otherwise enter the camera through the viewfinder. It has a width less than the width of the film unit it helps to protect and it prevents light entering through the viewfinder from reaching the film unit while the capping plate moves between the first and second positions. The use of a resilient material in the flap allows it to conform to a non-rigid wall which separates the viewfinder from the camera.

3,821,768

VIEWFINDER SHIELD IN A SINGLE LENS REFLEX CAMERA ADOPTING A TTL LIGHT MEASURING METHOD

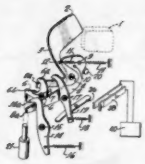
Fumio Urano, Wako; Naoyuki Uno; Katsuhiko Nomura, both of Kawagoe; Koichiro Watanabe, Funabashi; Tadazumi Sakazaki, Tokyo, and Katsuhiko Miyata, Kawasaki, all of Japan, assignoors to Asaki Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 9, 1972, Ser. No. 279,184

Claims priority, application Japan, Aug. 13, 1971, 46-61464

Int. Cl. G03b *13/02*

U.S. Cl. 354—219 **12 Claims**



A light-blocking plate released by a shutter button is inserted in the finder light path within a single lens reflex camera including an electric shutter device of TTL light measuring type for blocking only the inverse incident light coming through the finder eyepiece. A light measurement is completed after termination of blocking movement of the light-blocking plate and during the time period of such associating movements as the swinging-up movement of the reflecting mirror and the diaphragm value adjusting operation. After completing the shutter closing operation the light-blocking plate is retracted out of the finder light path by means of a mechanical lever and spring arrangment.

3,821,769

SHUTTER RELEASE APPARATUS FOR CAMERA

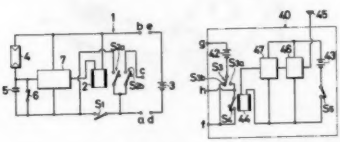
Toshinori Imura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 24, 1972, Ser. No. 283,594

Claims priority, application Japan, Sept. 4, 1971, 4680301

Int. Cl. G03b *9/62*

U.S. Cl. 95—53 EA **15 Claims**



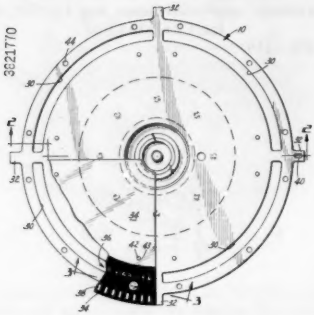
An apparatus comprising an exposure time controlling electric circuit including an electromagnet, a shutter mechanism for actuating a shutter opening member upon energization of the electromagnet and for actuating a shutter closing member upon deenergization of the electromagnet, a signal generator for producing an electrical signal to release the shutter upon closing of a switch, a signal receiver detachably mounted on the camera for receiving the electrical signal when mounted on the camera, and a remote control switch to be closed by the output of the signal receiver to initiate the exposure time controlling electric circuit into operation.

3,821,770

COMPOSITE PHOTOCOMPOSING TYPE DISC

William Rosenstein, South Orange, and Fred P. Oliva, Cranford, both of N.J., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Feb. 14, 1973, Ser. No. 332,477
Int. Cl. B41b 17/32
U.S. Cl. 95—85 2 Claims



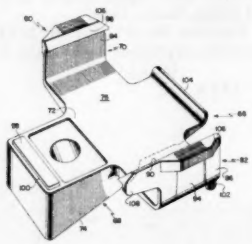
A composite font disc for a photocomposer machine wherein there is a disc spider which will hold one or many units for rotation and presentation of a font system to a lens system.

3,821,771

NON-FOLDING TRIPOD ADAPTER

Bruce K. Johnson, Andover, and John M. Reynard, Framingham, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 24, 1972, Ser. No. 300,158
Int. Cl. G03b 17/56
U.S. Cl. 95—86 13 Claims



A non-folding adapter for use with a folding photographic camera characterized in having an optical axis in a nonparallel orientation with respect to a supporting base of the camera. The adapter includes first and second sections angularly oriented with respect to each other. The adapter is configured to be attached to the supporting base of the camera for permitting a realignment of the camera's optical axis to a horizontal position when the camera and adapter are placed on a horizontal surface. The adapter permits the camera to be conveniently coupled to a conventional tripod or positioned on a flat surface with the optical axis horizontally directed. The adapter additionally includes a portion thereof which prevents inadvertent folding of the camera while the adapter is attached to the camera.

3,821,772

SCHOTTKY DIODE WITH MINIMAL METAL-GUARD RING OVERLAP

Ross Zwernemann, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 22, 1971, Ser. No. 191,672
Int. Cl. H01l 5/02
U.S. Cl. 357—15 4 Claims

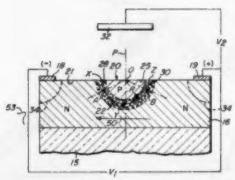
Providing a substrate doped with a first type of impurity and having a silicon dioxide ring deposited thereon which is doped with a second type of impurity. Treating the substrate to diffuse the impurities from the ring into the substrate immediately therebelow to form a guardring aligned with the aperture through the silicon dioxide ring. Depositing barrier and contact metals within the aperture of the silicon dioxide ring to form a Schottky barrier aligned with said guardring.

3,821,773

SOLID STATE EMITTING DEVICE AND METHOD OF PRODUCING THE SAME

John L. Mize, Dayton, Ohio, assignor to Beta Industries, Inc., Dayton, Ohio

Filed Jan. 24, 1972, Ser. No. 220,064
Int. Cl. H01l 5/00
U.S. Cl. 357—16 13 Claims



Charge carriers are emitted from the surface of a heterojunction region which is formed within the film-like body of a semiconductor material. The emitting region is defined by an interface which is generally semicircular in cross-section or has at least a substantial portion neither parallel nor perpendicular to the surface of the film-like body. The thickness of the film-like body is somewhat greater than the depth of the emitting region so that continuous uninterrupted and generally semi-cylindrical inner and outer depletion regions exist adjacent the interface. When a voltage is applied across the film-like body and hence across the emitting region, the depletion regions distort in a particular fashion and produce an electric field within the emitting region. Electrons crossing the interface are "heated" by this field to a degree permitting electron emission from the surface of the emitting region. The electron emission may be varied by altering the voltage applied across the junction.

3,821,774

ELECTROLUMINESCENT SEMICONDUCTOR DEVICES

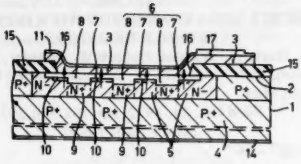
Julian Robert Anthony Beale, Salfords, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 17, 1972, Ser. No. 272,682

Claims priority, application Great Britain, July 28, 1971, 35401/71

Int. Cl. H01l 15/02

U.S. Cl. 357—17 17 Claims



An electroluminescent semiconductor device comprising, a first semiconductor body portion of a first conductivity type comprising wide energy band gap, luminescent material, a second semicondcutor body portion comprising narrow energy band gap material adjacent the first portion and forming with said first portion an abrupt heterojunction, and transistor means located in the second portion for producing and heating charge carriers of an opposite second conductivity type in the second portion, so that hot said charge carriers are injected from the second portion into the first portion to produce luminescence therein and further such transistor means for extracting from said first portion those of the heated said charge carriers of said second conductivity type not permanently injected into said first portion.

3,821,775

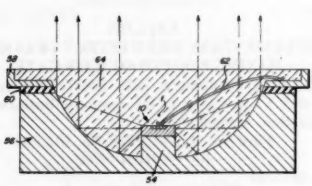
EDGE EMISSION GAAS LIGHT EMITTER STRUCTURE

James R. Biard, Richardson, Tex., assignor to Spectronics, Incorporated, Richardson, Tex.

Continuation of Ser. No. 183,027, Sept. 23, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,648

Int. Cl. H05b 33/00

U.S. Cl. 357—17 8 Claims



A light emitter structure in which the light output is primarily in the form of edge emission. The structure is a P-side up planar cylindrical unit having a N-type main body into which is diffused a reduced diameter P-type region. A major portion of both the N-type and P-type regions are covered with evaporated and alloyed metal contacts. The device is designed for mounting N-side down with connection to the anode or P-type layer being typically made by gold ball or thermal-compression bond to the alloyed metal ohmic contact on the P-type region. Several embodiments are disclosed. Also disclosed are several mounting techniques.

3,821,776

DIFFUSION SELF ALIGNED MOSFET WITH PINCH-OFF ISOLATION

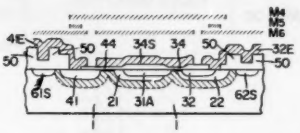
Yutaka Hayashi, and Yasuo Tarui, both of Tokyo, Japan, assignors to Kogyo Gijutsuin, Tokyo, Japan

Filed Dec. 27, 1971, Ser. No. 211,915

Claims priority, application Japan, Dec. 28, 1970, 45-120119

Int. Cl. H01l 19/00, 5/06

U.S. Cl. 357—23 8 Claims



An insulated gate field-effect transistor comprises a semiconductor substrate having a first and second region of opposite conductivity type from the substrate and having an impurity concentration greater than the substrate so as to develop depletion layers therebetween. A source region and a drain of the same conductivity type as the substrate are formed in the first region and the second region respectively. The depletion layers meet to electrically isolate a channel between the drain and source regions from the rest of the substrate. An insulating layer overlies the channel, a gate electrode is disposed on the insulating layer, and metallic source and drain electrodes make ohmic contact with the source and drain respectively. A plurality of insulated gate-field effect transistors are fabricated in an integrated circuit to form complementary pairs.

ERRATUM

For Class 357—29 see: Patent No. 3,821,616

3,821,777

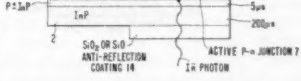
AVALANCHE PHOTODIODE

Lawrence W. James, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Sept. 22, 1972, Ser. No. 291,456

Int. Cl. H01l 15/00

U.S. Cl. 357—39 10 Claims



An avalanche photodiode, particularly useful for detection of infrared energy in the wavelength region from 1 to 2 microns, includes an active epitaxial layer of a quaternary III-V alloy such as $n\text{-}In_{1-x}Ga_xP_{1-y}As_y$. The active layer interfaces with a second lattice matched epitaxial layer of p-type material to define a lattice matched p-n junction therebetween which is reverse biased, in use. The active layer has a direct bandgap energy less than the photon energy of the infrared energy to be detected for absorption of the photons to be detected to generate electron-hole pairs. The active layer is made of a

material having an energy difference between the lowest conduction band minimum and the next higher conduction band minima either X_1 or L_1 which is greater than 1.1 times the direct bandgap energy of the active layer, whereby improved signal to noise ratio is obtained.

3,821,778

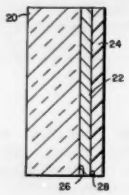
INFRARED PHOTOCATHODE

Stephen L. Kurtin, Sherman Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 4, 1972, Ser. No. 312,144

Int. Cl. H01I 19/00

U.S. Cl. 357—30 **7 Claims**



An infrared photoemitter and process for fabricating same wherein a thin metal layer is sandwiched in a composite structure between a suitable photoabsortive semiconductive layer and a low work function insulating layer. The semiconductive layer serves as a photon absorber and photoelection source for the device. The insulating layer is chosen for its low work function. The metal interlayer eliminates the heterojunction which in its absence would exist between the semiconductive and insulating layers and thereby eliminates the restriction that such heterojunctions impose on the efficiency and wavelength response of prior art composition photoemitters.

3,821,779

SEMICONDUCTOR DEVICE WITH HIGH CONDUCTIVITY AND HIGH RESISTIVITY COLLECTOR PORTIONS TO PREVENT SURFACE INVERSION

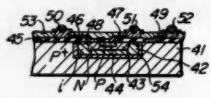
Koji Usuda, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 685,098, Nov. 22, 1967, abandoned. This application Aug. 28, 1969, Ser. No. 853,848

Claims priority, application Japan, Nov. 25, 1966, 41-76900

Int. Cl. H01I 7/02

U.S. Cl. 357—34 **6 Claims**



A semiconductor device comprising a monocrystalline region of a P-type high resistivity, a heavily doped P-type substrate deposited from vapor phase and having a plane surface common with a plane surface of the monocrystalline region, an N-type region formed in the monocrystalline region by introducing a donor type impurity from the common surface into the monocrystalline region, and a heavily doped P-type thin layer formed between the monocrystalline region and the substrate by introducing an accepter impurity into the surface of the monocrystalline region facing the substrate before depositing the heavily doped substrate on the monocrystalline region, whereby a space charge layer which might spread from the PN junction between the monocrystalline region and the N-type region through the P-type monocrystalline region during operation of the device is prevented by the heavily doped P-type thin layer from reaching the heavily doped P-type substrate which includes crystallographical defects and is apt to break down in a low electric field because of the crystallographic defects, and also an inversion layer induced in the monocrystalline region of P-type high resistivity by an SiO_2 film covering the common plane surface is interrupted by the heavily doped P-type substrate.

3,821,780

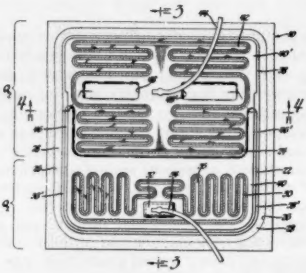
DOUBLE MESA TRANSISTOR WITH INTEGRAL BLEEDER RESISTORS

Glen E. Harland, Jr., and Robert W. Metzger, Jr., both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1972, Ser. No. 300,207

Int. Cl. H01I 19/00

U.S. Cl. 357—36 **4 Claims**



A high voltage and high current mesa type integrated circuit of cascaded common collector mesa emitter transistors and bleeder resistors that resist secondary breakdown. An integrated Darlington amplifier circuit is provided having an input emitter mesa which is an annulus surrounding an input transistor base region. An output transistor base region surrounds both the input emitter mesa and an output emitter mesa. In a preferred embodiment a third mesa is provided within the input transistor base region, to facilitate wire bonding to that region.

3,821,781

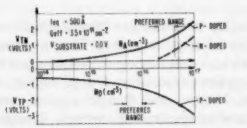
COMPLEMENTARY FIELD EFFECT TRANSISTORS HAVING P DOPED SILICON GATES

Chi Shih Chang, Wappingers Falls, and Teh-Sen Jen, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1972, Ser. No. 302,962

Int. Cl. H01I 19/00

U.S. Cl. 357—44 **5 Claims**



An insulated gate complementary field effect transistor integrated circuit uses silicon as the gate electrode. The gates of

both N- and P- channel transistors are doped with P type impurities, thereby balancing the voltage threshold characteristics of the transistors.

The gate insulator is dual nitride-oxide type, which, in combination with the P-type gates, results in a high surface-state charge density, and requires particular doping values for the channels of the complementary transistors.

3,821,782

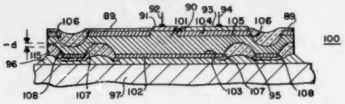
HIGH VOLTAGE SEMICONDUCTOR DEVICE WITH PLURAL GROOVES

Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234

Continuation of Ser. No. 106,436, Jan. 14, 1971. This application Sept. 4, 1973, Ser. No. 394,093

Int. Cl. H01I 5/00, 11/10

U.S. Cl. 357—55 **10 Claims**



A semiconductor device that comprises a body of semiconductor material having first and second continuous grooves in first and second opposite surfaces at the periphery thereof, respectively, in which the combined depths of the two grooves are substantially equal to or greater than the thickness of the body between the opposite surfaces. The grooves are offset or laterally spaced apart, with the surfaces thereof being etched smooth so that the electric field is not distorted at the edge of the device.

3,821,783

SEMICONDUCTOR DEVICE WITH A SILICON MONOCRYSTALLINE BODY HAVING A SPECIFIC CRYSTAL PLANE

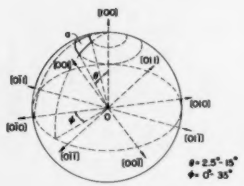
Yoshimitsu Sugita; Teruo Kato; Katsuro Sugaware, all of Tokyo, and Masao Tamura, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 2, 1971, Ser. No. 120,289

Claims priority, application Japan, Mar. 2, 1970, 45-17084

Int. Cl. H01I 5/00

U.S. Cl. 317—235 AS **11 Claims**



A semiconductor device comprising a silicon monocrystalline body having a major flat surface having a specific crystallographic orientation deviating 2.5° to 15° from the [100] axis, preferably toward an axis, in the (100) plane, selected from the group consisting of 0° to 35° off one of the axes [010], [001], [0$\bar{1}$0] and [00$\bar{1}$]

3,821,784

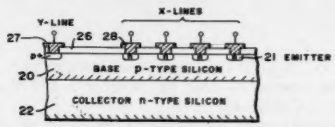
SWITCHING TRANSISTOR WITH MEMORY

David L. Heald, Santa Barbara, and James W. Holm-Kennedy, Venice, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed July 10, 1972, Ser. No. 270,553

Int. Cl. H01I 11/06

U.S. Cl. 357—6 **16 Claims**



A switching transistor with memory is provided in which a selected junction (preferably the base-emitter junction) is fabricated to have a high injection efficiency and multiple acceptor or multiple donor trapping centers distributed in and around the depletion region of the junction. The trapping centers are chosen to be of a type for field-induced trapping dominant carriers transported across the selected junction when forward biased. To switch the transistor from one I-V characteristic to a lower I-V characteristic, the selected junction is biased in a forward direction to a predetermined threshold level for field-induced trapping of said carriers by the distributed trapping centers, thereby creating a stable and stationary space charge domain in the current path of the selected junction. The transistor is reset by reverse biasing the selected junction to a level where the space charge domain is annihilated.

3,821,785

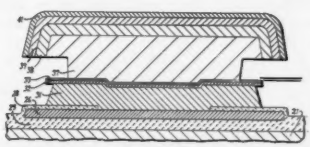
SEMICONDUCTOR STRUCTURE WITH BUMPS

Ralph Edward Rose, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Mar. 27, 1972, Ser. No. 238,116

Int. Cl. H01I 5/00

U.S. Cl. 357—67 **18 Claims**



Semiconductor structure having a semiconductor body with a planar surface and with metallic contact pads formed over the surface. A layer of insulating material is formed over the contact pads. Bumps or pillars are formed which extend through the layer of insulating material and are bonded to the contact pads. The bumps or pillars are formed of a relatively ductile aluminum layer. A base portion is secured to the ductile layer and has a mushroom-shaped configuration. Gold-tin layers are carried by the base and form a gold-tin system so that the bumps or pillars can be readily bonded to the lead frames.

In the method, a semiconductor body is provided having a planar surface and having metallic contact pads formed over the surface. An insulating layer is formed over the contact pads. Openings are formed in the insulating layer. Bumps or pillars are formed which extend through the openings in the insulating material and make contact with and are secured to the pads. The bumps or pillars are formed by first forming a

relatively thick aluminum layer making contact with the pads and then forming bases which are secured to the relatively thick aluminum layers. Gold-tin layers are formed on the bases to provide a gold-tin system. During the formation of the base and the gold-tin layers, a layer of photoresist is provided so that the bumps or pillars assume a mushroom-shaped configuration.

3,821,786

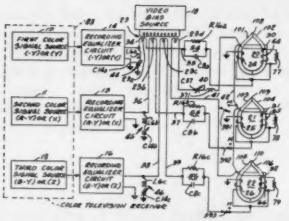
VIDEO TRANSDUCING APPARATUS

Marvin Camras, Glencoe, Ill., assignor to ITT Research Institute, Chicago, Ill.

Division of Ser. No. 34,504, May 4, 1970, Pat. No. 3,705,954, which is a division of Ser. No. 649,256, June 27, 1967, Pat. No. 3,596,008, which is a continuation-in-part of Ser. No. 528,934, Feb. 21, 1966, abandoned. This application Sept. 20, 1971, Ser. No. 182,212

Int. Cl. H04n *9/02*

U.S. Cl. 358—4 **7 Claims**



Monochrome and color television recording and playback circuitry for coupling of a video magnetic transducer head with a standard broadcast television receiver, the receiver having a matrixing circuit with X and Z inputs and R-Y, G-Y and B-Y outputs, and the head playback amplifier supplying R-Y and B-Y signals to the X and Z inputs of the matrixing circuit during reproduction of color television signals from the record medium.

3,821,787

MAGNETIC RECORDING AND/OR REPRODUCING SYSTEM

Nobutoshi Kihara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

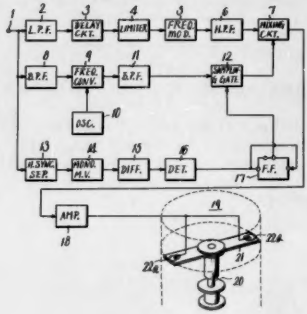
Filed Aug. 3, 1972, Ser. No. 277,815

Claims priority, application Japan, Aug. 13, 1971, 46-61460; Aug. 24, 1971, 46-64625

Int. Cl. H04n *5/76*

U.S. Cl. 358—4 **38 Claims**

Improved utilization of magnetic tape is obtained in recording video signals by recording the slant tracks closer together or even overlapping. The possibility of interference between the adjacent tracks is reduced by gating the signals recorded on adjacent tracks so as to record only alternate intervals of at least selected portions on each track. The intervals are chosen so that the areas on one track on which such selected portions are recorded are adjacent areas on the next adjacent track on which the selected portions are not recorded. In playback the recorded selected portions are combined with replicas thereof delayed an odd multiple of each recording interval, thereby reconstituting a continuous video signal. Preferably, alternate line intervals are recorded, and the delay in playback is thus



an odd multiple of a line interval. The selected portions gated for alternate intervals may be the chrominance signals or even the entire video signal.

3,821,788

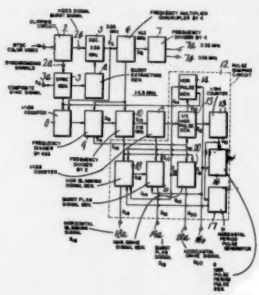
COLOR SYNCHRONIZING SIGNAL GENERATING DEVICE

Yoshikazu Kobayashi, Kawasaki, Japan, assignor to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.), Tokyo, Japan

Filed Dec. 4, 1972, Ser. No. 312,196

Int. Cl. H04n *9/46*

U.S. Cl. 358—19 **5 Claims**

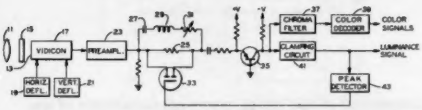


A synchronizing signal generating device in which a 3.58 MHz burst signal is extracted from an external NTSC color composite signal with a burst flag signal and the burst signal of 3.58 MHz is continuously oscillated. In this case, a signal separated from synchronizing signals in synchronized relationship is subtracted therefrom by the 3.58 MHz of the burst signal, this subtracted signal is counted down to produce the vertical synchronizing signal, and the synchronizing signal is obtained from the vertical synchronizing signal in gen-locked condition.

3,821,789
CHROMA TRACKING CIRCUIT

Jesse Durbin, Jr., and John Ralph D'Aiuto, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Nov. 6, 1972, Ser. No. 304,281
Int. Cl. H04n *9/04, 9/48*
U.S. Cl. 358—27 **16 Claims**

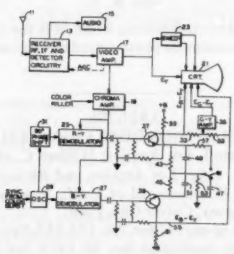


A feedback circuit to prevent loss of relative color saturation at increased illumination levels in a one tube color camera television system is disclosed comprising means for sensing variations in the absolute magnitude of the luminance signal, and means responsive thereto for varying the gain imparted to the luminance signal or to the chrominance signal relative to the other signal. In one preferred embodiment the variable gain is achieved by providing a variable impedance comprising first and second parallel branches, the first of which presents a relatively low impedance to the chrominance signal frequency range and a relatively high impedance to the luminance signal frequency range and the other of which has an impedance which is substantially frequency independent and is intermediate the relatively low and relatively high impedances characteristic of the first branch. A shunt means in the form of a field effect transistor is in parallel with these branches and is gated by a control signal indicative of the luminance signal magnitude so that when the field effect transistor conducts, the over-all impedance of the parallel combination decreases more rapidly for signals in the luminance signal frequency range than for signals in the chrominance signal frequency range thereby varying the relative gain of the luminance signals to the chrominance signals.

3,821,790
AUTOMATIC TINT CIRCUIT FOR FLESH TONE CORRECTION

Clifton C. Perry, Fort Wayne, Ind., assignor to The Magnavox Company, Ft. Wayne, Ind.

Filed Aug. 18, 1972, Ser. No. 281,899
Int. Cl. H04n *9/12*
U.S. Cl. 358—28 **11 Claims**



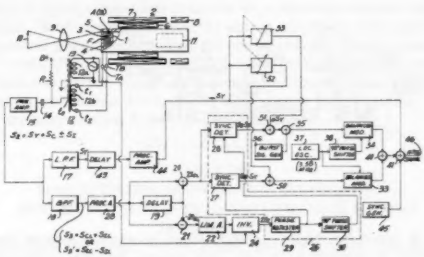
A circuit for providing natural looking flesh color in a color television receiver is disclosed having at least two primary color amplifiers therein comprising a viewer actuable switch, first means responsive to actuation of the switch to change the gain of at least one of the amplifiers, and second means responsive to the actuation of the switch to change the input-output phase shift of at least one and generally both of the amplifiers. The switch is effective in one position to bypass an impedance which is common to both amplifier circuits and thus render them independent while in another position it functions to insert this common impedance making the amplifier circuits' phase shift behavior interdependent. In this other position the switch also functions to add additional resistance in parallel with an existing transistor emitter circuit resistor to thereby change the relative gains of the amplifier stages.

3,821,791
WHITE BALANCE CONTROL SYSTEM

Kazuhiko Nakajima, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 21, 1972, Ser. No. 236,715
Claims priority, application Japan, Mar. 23, 1971, 46/16715
Int. Cl. H04n *9/04*
U.S. Cl. 178—5.4 BT **2 Claims**

A white balance system for a color television camera in which a plurality of adjustable potentiometers are connected in parallel across the output load of a transistorized phase splitting circuit fed by a delayed form of the luminance signal. The movable contacts of the potentiometers are separately connected to the fixed contacts of a pair of rotary switches whose movable contacts are ganged. The movable switch contacts are separately connected through adding circuits to the color demodulator circuit of the camera so that the signals appearing at the movable contacts of a selected pair of the potentiometers are combined with the color difference signals. The settings of the potentiometers compensate for predetermined levels of illumination to produce a properly white balanced chrominance signal.



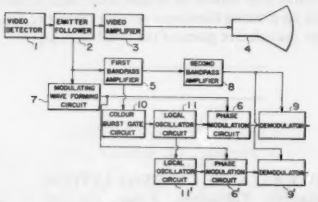
3,821,792
COLOUR TELEVISION RECEIVER

Yasumasa Sugihara, and Mitsutaka Takayama, both of c/o The General Corporation, 1116 Suenaga, Kawasaki, Japan

Filed Dec. 6, 1971, Ser. No. 205,079
Claims priority, application Japan, Feb. 2, 1971, 46-3880; Feb. 23, 1971, 46-9199
Int. Cl. H04n *9/12*
U.S. Cl. 358—35 **8 Claims**

A colour television receiver for receiving a colour television signal is characterized by the provision of a phase modulation circuit in a chrominance signal processing circuit of the

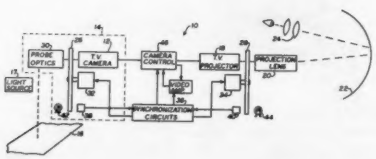
receiver, said phase modulation circuit being responsive to a voltage of suitable polarity and magnitude related to the magnitude of the luminance signal for correcting differential phase distortion of the colour television signal caused by transmission lines therefor.



3,821,793
VISUAL SIMULATOR EMPLOYING TWO-COLOR TELEVISION SYSTEM

Edward R. Carson, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed June 8, 1972, Ser. No. 260,880
Int. Cl. H04n *9/22*
U.S. Cl. 178—5.4 CF **5 Claims**



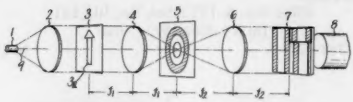
A two-color, high resolution video generation system. An object is scanned by a television camera through a rotating color wheel which has alternating filter segments of two different colors. The camera output signal is transmitted to a television projector which projects the image through a second rotating color wheel to a screen. The second rotating color wheel also has filters arranged in alternate segments preferably of the same two colors depending on the application. Means are provided for maintaining the two-color wheels in a synchronous rotation and for maintaining the television camera and projector in synchronization with one another and with the color wheels.

3,821,794
PHOTOGRAPHIC COLOR FILM TELEVISING APPARATUS

Masahide Yoneyama, Kawasaki, Japan, assignor to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.), Tokyo, Japan

Filed Dec. 8, 1971, Ser. No. 205,807
Claims priority, application Japan, Dec. 12, 1970, 45-110906
Int. Cl. H04n *9/06*; **G02b** *27/38*
U.S. Cl. 358—47 **2 Claims**

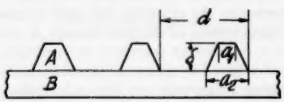
A single-tube photographic color film televising apparatus having an optical system. In this case the optical system consists of a device for Fourier transformation of an image to be televised and a spatial filter for band-width limitation of three color components of said image to prevent occurrence of spurious signals due to crosstalk between said three color components.



3,821,795
OPTICAL LOW-PASS FILTER

Yukio Okano, Minamikawachi-gun, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 2, 1972, Ser. No. 293,976
Claims priority, application Japan, Oct. 8, 1971, 46-78729
Int. Cl. H04n *9/06*
U.S. Cl. 178—5.4 ST **8 Claims**



An optical low-pass filter utilizing a phase grating is employed in a color television camera system. In order to eliminate the higher order spectra which produce flare or low contrast image, the strips of the phase grating are so shaped that their side surfaces are inclined to the base body or substrate. Such phase gratings, for example, are trapezoidal-wave, triangular-wave and sinusoidal-wave phase gratings. In the case of trapezoidal shaped laminae the following conditions apply:

$$1 - 0.65\, d/a_r \leqq \cos\delta \leqq 1 - 0.35\, d/a_r$$

$$d/a_r \leqq 2$$

where a_r is the effective lamina width, d is the spacing of the lamina and δ is maximum phase retardation introduced by the laminae.

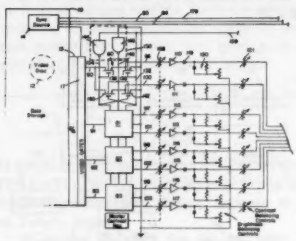
3,821,796
TELEVISION DISPLAY SYSTEM

Michael N. Ernstoff, Los Angeles; William C. Hoffman, Torrance; Eric R. Fehr, Los Angeles, and Richard N. Winner, Palos Verdes Peninsula, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 115,553, Feb. 16, 1971, abandoned. This application Jan. 30, 1973, Ser. No. 327,896
Int. Cl. H04n *9/12*
U.S. Cl. 358—65 **4 Claims**

A low bandwidth high brightness display system that utilizes a multiple beam cathode ray tube to write a raster by concurrently scanning a plurality of lines with a selected number of beams. The system thus reduces the maximum data rate and writing speed relative to conventional arrangements with a resultant bandwidth reduction proportional to the number of beams. The concept is applicable to field sequential color

television to produce simultaneously a high resolution, high brightness and high quality color display. For interlace, the



multibeam tube grid may be switched so that, for example, during alternate fields of a frame, different sets of electron beams are applied to the tube face.

3,821,797

SYSTEM FOR RECORDING AND REPRODUCING A WIDE-BAND SIGNAL

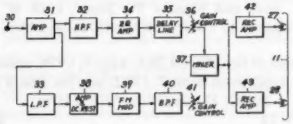
Takahiro Suzuki, and Yoshihiko Ota, both of Tokyo, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 42,958, June 3, 1970, Pat. No. 3,723,643, which is a continuation of Ser. No. 773,848, Nov. 6, 1968, abandoned. This application Dec. 20, 1972, Ser. No. 316,741

Claims priority, application Japan, Nov. 8, 1967, 42-71386; June 6, 1969, 44-44133

Int. Cl. G11b *5/04*

U.S. Cl. 360—24 **10 Claims**



A tape recorder has the capability of recording a predetermined band width of signals which is not as wide as a TV band width. To record a TV band, the signals are divided into high and low component band. The high frequency band component is recorded directly on the recording medium, and the low frequency band component is frequency modulated on a carrier wave with an index of modulation which is over unity. The lower frequency limit of the deviated carrier wave is substantially equal to or higher than the highest frequency component of the wide-band signal. The frequency modulated carrier wave is recorded on the recording medium at a level at which it acts as a bias signal with respect to the high frequency band component. The original wide-band signal is reproduced from the recording medium during playback when the component bands are separated, demodulated, and recombined. The high frequency band component played back from the recording medium is controlled by other frequency component played back at the same time so that the level variations of the high frequency band component is corrected.

3,821,798

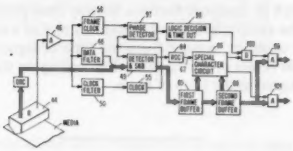
RESYNCHRONIZABLE RECORDING SYSTEM

Maxwell R. Cannon, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 229,214, Feb. 18, 1972, Pat. No. 3,765,005. This application Apr. 9, 1973, Ser. No. 349,573

Int. Cl. G11b *5/02*

U.S. Cl. 360—51 **22 Claims**



A digital magnetic recorder combines a data signal and a control or resync component signal having a frequency exactly a submultiple of the data bit rate. Optionally, additional control signals at frequencies above or below the data bandwidth, but within the available recorder bandwidth, may be recorded. For enabling resynchronization in a multi-track magnetic recording system, a signal component is added at a frequency near a clock frequency such that the difference between this signal and the clock has a wavelength on the magnetic media greater than the maximum skew of the multi-track system. Alternatively, a signal having a wavelength greater than such maximum skew can be recorded with the data signals as a resynchronization control signal component. Such signal component is usable as a resynchronization pattern. Write errors are detected during recording with special control indicia recorded on the media indicating such errors. Various forms of indicia are described including special data patterns, special signal components, and the like. Special circuits established for handling data signals using framing or resynchronization techniques are described.

3,821,799

MAGNETIC RECORDING AND REPRODUCING APPARATUS WHICH PREVENTS ERASING DURING TAPE LOADING

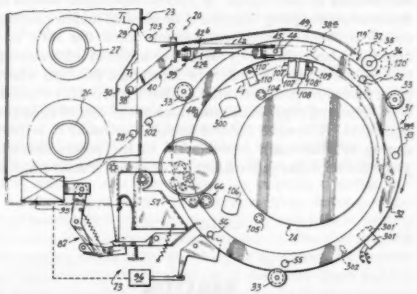
Koichiro Sumiyoshi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 19, 1971, Ser. No. 200,540

Claims priority, application Japan, Nov. 24, 1970, 45-116715[U]

Int. Cl. G11b *15/66, 23/04, 5/52*

U.S. Cl. 360—60 **7 Claims**



In a magnetic recording and reproducing apparatus with an automatic tape loading device for drawing a magnetic tape

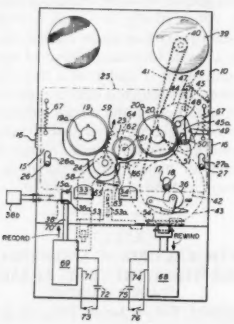
from between reels on which it is wound, for example, in a cassette or cartridge, and wrapping or loading the withdrawn tape about a guide drum having at least one rotary magnetic head associated therewith to scan the tape on the drum during recording and reproducing apparatus, and in which an erasing head is provided to erase signals on the tape prior to the scanning thereof by the rotary head during recording operations; a single manually actuable recording control is provided to initiate the recording operation by first causing operation of the tape loading device, and the completion of the tape loading operation is detected, for example, by automatic actuation of a switch in response thereto, to only then permit energization of the erasing head, and preferably also of a recording circuit, for avoiding erasure from the tape of signals which it is desired to retain or the undesired recording on the tape of the erasing signal in the form of noise.

3,821,800

RECORDER-REPRODUCER WITH SOLENOID-CONTROLLED RECORD AND REWIND OPERATIONS

John Maltese, Saddle Brook, N.J., assignor to E.R.E. Laboratory, Inc., West Orange, N.J.

Filed Aug. 28, 1972, Ser. No. 283,943
Int. Cl. G11b *15/10, 5/54, 15/44*
U.S. Cl. 360—62 **5 Claims**



A repeat magnetic tape recorder-reproducer has slide control means spring-urged to engage the record-reproduce head with the tape and to place the dirve mechanism in normal drive operation, and is operable by a remote-controlled power solenoid to disengage the head and to start the the drive mechanism in fast reqind. A record-reproduce switch has a lost-motion coupling with the slide control means causing the switch to be in reproduce position when the slide control means has been shifted by the power solenoid into reqind position and leaving the switch in reproduce position when the power solenoid is deactivated so that the recorder-reproducer is in operating reproduce condition at the end of each rewind operation. A remote control impulse solenoid is activatable during or after each deactivation of the power solenoid to place the recorder-reproducer in operating record condition.

ERRATUM

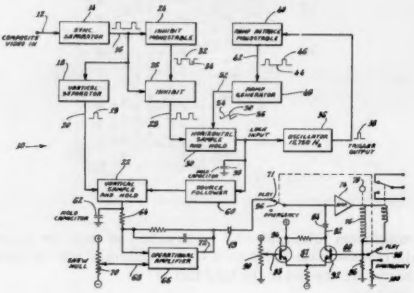
For Class 360—70 see:
Patent No. 3,821,467

3,821,801

AUTOMATIC SKEW CORRECTOR HAVING TENSION CONTROL

Thorsten P. Cook, Pound Ridge, N.Y., assignor to Goldmark Communications Corporation, Stamford, Conn.

Filed May 17, 1973, Ser. No. 361,132
Int. Cl. H04n *5/78*; **G11b** *15/43, 15/52*
U.S. Cl. 360—70 **10 Claims**



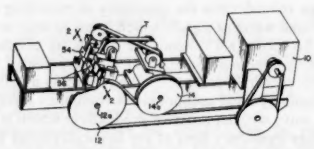
A skew corrector is described whereby the tension of the video tape in a video tape playback device is automatically corrected. The skew corrector is particularly suitable for insertion in existing video tape playback devices which do not include automatic skew correction. A minimum amount of physical modification is required whereby a composite video signal is taken from the video playback device and processed to remove horizontal sync and vertical sync signals. An inhibit network is employed to prevent, during video field changes, the operation of a horizontal synchronization circuit with which a pulse generator is phase locked to the horizontal sync pulses. A vertical sync actuated sample and hold network is employed to store a tape tension error signal used to vary the tape tension to remove visual skew problems.

3,821,802

TAPE MOVEMENT INDICATION MEANS AND SIGNALLING DEVICE

William M. Nye, and Stanley W. Jones, both of Bellevue, Wash., assignors to Lanier Electronic Laboratory, Inc., Atlanta, Ga.

Continuation of Ser. No. 60,285, Aug. 3, 1970, abandoned.
This application Sept. 7, 1972, Ser. No. 286,870
Int. Cl. G11b *27/16, 25/6, 15/18*
U.S. Cl. 360—72 **19 Claims**



An optical sensing system for a recorder-transcriber detects the passing of evenly spaced holes in a recording tape and transmits signals to "up" and "down" stepping motors which drive an indicator through a differential drive assembly. Dictate-forward and reverse controls and secretary-forward and reverse controls are provided and are coupled to the optical sensing means in a manner such that passing of a hole in the secretary-forward or dictate-reverse directions will energize

the "down" stepping motor and passing of the holes in the secretary-reverse or dictate-forward direction will energize the "up" stepping motor.

A signalling device for indicating a percent of capacity of a recorder-transcriber includes a cam actuated signal producing switch in which the cam is driven by a pin attached to a cam driver that is coupled to the differential assembly. The pin may be seated in slots of various lengths. Each slot corresponds to a different quantity recorder-transcriber capacity and provides a lost-motion connection wherein the signal generated is terminated only after the pin has traversed the slot.

3,821,803

VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS WITH TAPE SPEED CONTROL

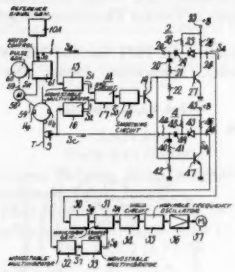
Hitoshi Sakamoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 30, 1972, Ser. No. 301,989

Claims priority, application Japan, Oct. 29, 1971, 46-86029

Int. Cl. H04n *5/78*

U.S. Cl. 360—73 **10 Claims**



In a video signal recording and reproducing apparatus having a magnetic head or heads for recording and reproducing a video signal on a magnetic tape driven at a variable speed, and in which first and second reference signals are generated with different polarities for the odd and even numbered fields of a video signal, for example, in response to a video signal being reproduced from the tape and an external video signal, respectively; there is provided a servo system which, through controlling the speed at which the tape is driven, achieves frame matching or coincidence of the reproduced and external video signals and also achieves a tracking servo operation, that is, accurate time coincidence of the like-numbered fields of the reproduced and external video signals.

3,821,804

SERVO SYSTEM FOR POSITIONING DATA TRANSDUCER

Timothy John Stevenson, 163, Clewer Rd., Windsor, and Raymond Yardy, 4, Bartons Dr., Yately, near Camberley, both of England

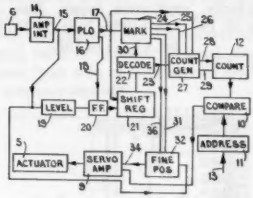
Filed Jan. 17, 1973, Ser. No. 324,544

Claims priority, application Great Britain, Jan. 19, 1972, 2602/72

Int. Cl. G11b *5/56*

U.S. Cl. 360—77 **10 Claims**

A servo system is disclosed for positioning a magnetic transducer in relation to a plurality of tracks on a disc record. A servo transducer moves across a plurality of servo tracks in synchronism with movement of the magnetic transducer. Discrete signals are recorded in the servo tracks in such a manner



that movement of the servo transducer from one pair of servo tracks to generate track change signals which are different according to direction of movement of the transducer.

3,821,805

TAPE LOADING DEVICE FOR MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

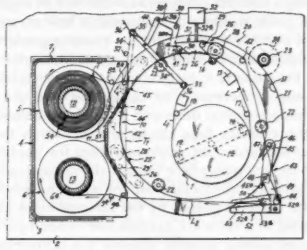
Akio Serizawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 27, 1973, Ser. No. 354,992

Claims priority, application Japan, May 4, 1972, 47-52394[U]

Int. Cl. G11b *15/66, 5/52*

U.S. Cl. 360—85 **14 Claims**



In a magnetic recording and/or reproducing apparatus having a tape guide drum, at least one rotary magnetic head moved in a circular path coinciding with the circumferential surface of the drum for scanning a magnetic tape wrapped about at least a portion of that surface, a tape supply, such as, a cassette containing reels on which a magnetic tape is wound, and a holder for receiving and positioning the cassette at a location spaced from the guide drum, a tape engaging member is provided on a rotatable support ring which extends under the cassette so that, when the ring is in a starting position, the tape engaging member extends into an opening of the cassette for engagement with the tape between the reels, and a tape guiding member mounted on the support ring and being moved relative to the latter from an inner position, at which the tape guiding member also extends into the cassette opening with the support ring at its starting position, to an outer position spaced outwardly from the support ring in response to turning of the latter to an operative position, during which turning the tape engaging member draws a loop of tape from the cassette and wraps one side of the loop about the guide drum and the tape guiding member engages the other side of the tape loop and, in its outer position, maintains said other side of the tape loop away from the guide drum.

3,821,806

CASSETTE TAPE APPARATUS

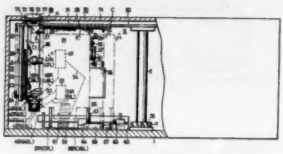
Yasuhiro Uemura, Tokyo, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed June 19, 1972, Ser. No. 264,180

Claims priority, application Japan, June 20, 1971, 46-44079; June 20, 1971, 46-44080; June 20, 1971, 46-44081

Int. Cl. G11b *5/00*

U.S. Cl. 274—4 F **4 Claims**



A cassette tape apparatus which employs a cassette having a magnetic tape wound on reels housed in a casing and is designed to record signals on the tape or reproduce them therefrom based upon a cassette tape deck with the cassette held on a cassette holder, and in which the cassette holder is adapted to turn through a predetermined rotational angle on the chassis and hold a plurality of cassettes with their major faces being held vertical at intervals of the afore-mentioned rotational angle and the cassette tape deck is constructed to move on a straight line toward and away from the major face of one of the cassettes within an area surrounded by the cassettes held on the cassette holder; in which the cassette holder is adapted to hold the cassette with its major face being vertical, the cassette tape deck is adapted to move toward and away from the major face of the cassette and has a horizontal plate having a cassette guide window formed in alignment with a cassette guide window of the cassette holder, an actuating member is slidably disposed on the cassette guide window of the horizontal plate in such a manner as to assume a position to permit the cassette to be guided to the cassette holder and a position not to permit it to be guided and the actuating member has associated therewith a switch for electrically controlling the cassette tape deck; and in which the cassette holder has left and right guide members for guiding the cassette with its first major face being held vertical, a first sliding member having a horizontal plate for receiving a second major face of the cassette guided by the left and right guide members, slidable in a vertical direction and biased by a first spring and a second sliding member slidable in a horizontal direction and biased by a second spring for retaining the cassette guided by the left and right guide members and received by the first sliding member, thereby holding the cassette. The cassette tape deck is designed to move toward and away from the major face of the cassette held by the cassette holder and has means for releasing the cassette from its condition held by the cassette holder.

3,821,807

MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS OPERABLE WITH TAPE CARTRIDGE AND HAVING FAST FORWARD MECHANISM

Toshio Kawada, Neyagawa; Tadashi Torama, Osaka, and Tamio Kobayashi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

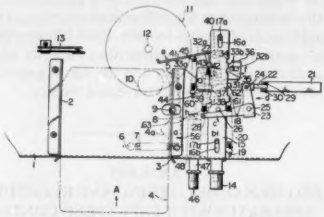
Filed Sept. 26, 1972, Ser. No. 292,318

Claims priority, application Japan, Sept. 30, 1971, 46-76973; Sept. 30, 1971, 46-76974; Sept. 30, 1971, 46-76975; Sept. 30, 1971, 46-76976; Sept. 30, 1971, 46-76977

Int. Cl. G11b *15/28, 15/46, 23/04*

U.S. Cl. 360—93 **4 Claims**

A magnetic tape recording and reproducing apparatus having a tape fast forward mechanism and a recording mechanism, and being operable with an endless tape cartridge, which is so designed that a fast forward switch is inoperable after the apparatus has been placed in a recording position upon switching a recording-reproduction selector switch by the operation of a recording lever.



3,821,808

TAPE CARTRIDGE ADAPTOR UNIT

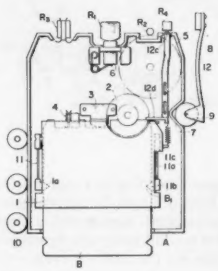
Eiichi Wada, Yokohama, and Yoshio Ono, Uokohama, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 21, 1971, Ser. No. 210,487

Claims priority, application Japan, Dec. 21, 1970, 45/131982

Int. Cl. G11b *5/00*

U.S. Cl. 360—94 **1 Claim**



A magnetic tape cartridge adaptor for playing a small sized endless tape cartridge with a conventional tape recorder unit. The cartridge adaptor has therein a loading box into which the small sized cartridge may be inserted for playing. Locking means are provided for fixing the small sized cartridge in position within the loading box, and a switching means is used for permitting the tape recorder unit to play upon insertion of the small sized cartridge. The cartridge adaptor is also provided with a driving roller to drive the tape in the small sized cartridge which is driven by a capstan in the tape recorder unit through an idler, a recording and reproducing mgnetic head, and an electrical sensing post. When the small sized cartridge is inserted into the loading box, the locking means can engage with recessed portions formed on both sides of the cartridge, and the cartridge actuates the switching means to start the operation of the tape recorder unit, whereby the driving roller is driven to transport the tape in the small sized cartridge.

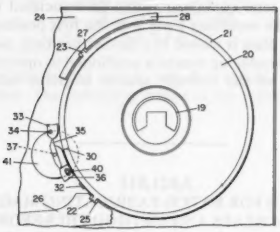
ERRATUM

For Class 360—94 see:
Patent No. 3,820,706

3,821,809
CARTRIDGE OPENER DEVICE

Frank H. Kaufholz, Jr., Havertown, Pa., assignor to Computer Peripherals, Inc., Edina, Minn.

Filed June 7, 1973, Ser. No. 368,039
Int. Cl. G11b 23/04, 15/60
U.S. Cl. 360—95 9 Claims

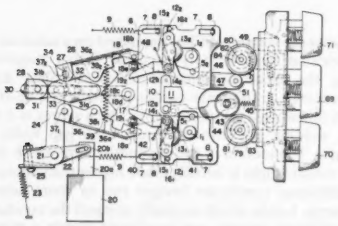


There is disclosed a tape cartridge opener which includes a rotatable member which when rotated through a predetermined angle will move the tape cartridge to an open position, an actuating mechanism for rotating and holding the rotatable member in said rotated position including a pressure actuated piston means for actuating said rotatable member, selectively operated latching means for positioning and holding the piston means in an actuated position and resilient means for returning the piston member to its home position upon release of the piston means by the latching means.

3,821,810
TAPE RECORDER

Yoshio Maruyama, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed June 28, 1971, Ser. No. 157,590
Claims priority, application Japan, June 27, 1970, 45-56264
Int. Cl. G11b 15/26
U.S. Cl. 360—96 3 Claims



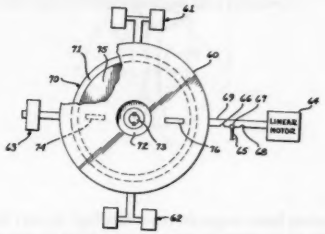
In a reversible tape recorder, means are provided for effecting a direction of tape feeding during the reproducing operation that corresponds to the direction of tape feeding during the fast feeding operation, when there is a change from the fast feeding to the reproducing operation. Such means comprise a rotatable cam plate which is rotatable in opposite directions to effect changes in the tape feeding direction.

3,821,811
DAMAGE PROOF DISCFILE FOR STORING MAGNETICALLY ENCODED INFORMATION

Harold R. Klievoneit, 31 S. 40th Pl., Phoenix, Ariz. 85034

Filed Dec. 22, 1972, Ser. No. 317,731
Int. Cl. G11b 5/40
U.S. Cl. 360—98 8 Claims

In order to provide highly reliable apparatus for effecting discfile storage of magnetically encoded information, alternate rotating discs and stationary headframes having substrates of extremely hard ceramic material carrying, respectively, coatings of magnetizable material and record/playback heads are interleaved. The heads are disposed flush with or very slightly below one or both faces of the headframes, which faces are maintained to a close order of flatness, finish, and parallelism. The rotating discs carry the magnetic medium upon one or both faces thereof in a coaxial recess which leaves a circumferential band of ceramic material about the outer edge of the faces flush with or very slightly above the upper surface of the magnetic medium.



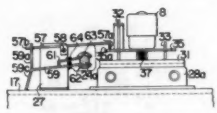
In operation, the interleaved discs and headframes are stacked, preferably horizontally, with headframes disposed outboard at both ends of the stack. One of the outboard headframes is fixed in position with respect to movement along the stack axis. The other outboard disc is resiliently biased against the stack. Upon instituting rotation of the discs carrying the recording medium, the ceramic bands function as "flying bands" to effect a slight separation betwen adjacent discs thereby permitting high speed operation without contact while nonetheless maintaining only the very narrow gap between the heads and the recording medium necessary for reliable storage and playback.

A method for fabricating both the rotating and stationary discs is disclosed.

3,821,812
DEVICE FOR MOVING MAGNETIC HEAD AWAY FROM MAGNETIC SHEET IN MAGNETIC RECORDING AND REPRODUCING APPARATUS OF THE SPIRAL TRACK TYPE

Saburo Kato, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1971, Ser. No. 192,879
Claims priority, application Japan, Nov. 5, 1970, 45-97444
Int. Cl. G11b 5/82, 21/04
U.S. Cl. 360—101 11 Claims

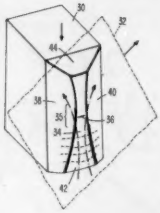


A device for moving a magnetic head away from a magnetic sheet in magnetic recording and reproducing apparatus of the spiral track type which is operative to move the magnetic head away from the magnetic sheet when a turntable provided with the magnetic head for recording and playback rotates at a higher rate than when recording or playback is carried out or when the turntable rotates in the reverse direction.

3,821,813
WASP-WAIST HEAD FOR FLYING FLEXIBLE MAGNETIC STORAGE MEDIUM OVER HEAD

Fredric R. Freeman; William R. Golz, and William K. Taylor, Jr., all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1972, Ser. No. 318,973
Int. Cl. G11b *5/60, 5/24*
U.S. Cl. 360—103 **9 Claims**

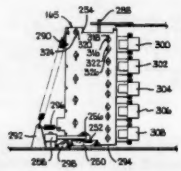


In rotating head magnetic recorders high density recording with little or no wear to the magnetic head or the magnetic tape has been achieved with a wasp-waist flying head. The tape flies in the range of approximately 20–50 microcinches from the surface of the head. Initially the top surface of the head is single radius or bi-radius in contour. Sides of the head are beveled so as to give a wasp-waist shape to the top surface of the head. Further, the top surface of the head is polished, usually with abrasive tape to smooth sharp edges of the head and also to more nearly conform the top surface of the head to the aerodynamic bulge in the magnetic tape that occurs as the tape flies over the head. The head is mounted with the wider portion or frontal face of its top surface forming an angle of attack between the frontal face and the medium. Air caught between this frontal face and the tape is later partially dissipated as the tape moves past the narrow waist of the top surface of the head. Initially an air wedge lifts the tape away from the head, and subsequently the tape is lowered uniformly towards the narrow waist of the head as the head moves under the tape. The read/write gap would be located somewhere in the region of the narrow waist where the flying height is relatively uniform and controllable within the desirable range of 20–50 microinches.

3,821,814
APPARATUS FOR PROVIDING INDIVIDUAL ADJUSTMENT OF MOVABLE MULTIPLE TRANSDUCERS IN A PLURAL TAPE CARTRIDGE PLAYER

Franklin Gordon, Zionsville, and Dallas Roy Andrews, Kirklin, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 14, 1972, Ser. No. 306,413
Int. Cl. G11b *21/08, 21/24*
U.S. Cl. 360—106 **7 Claims**

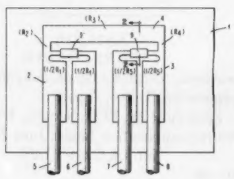


A magnetic head assembly cooperates with a tape cartridge player of the type adapted to play a plurality of tape cartridges supported in a stacked array and of the type wherein the tape contained within each of the cartridges includes laterally spaced magnetic information tracks. The assembly includes a mounting plate supported for sequential movement between a first position and one or more further positions. The plate supports a plurality of transducing means each adapted to cooperate with a different one of the plurality of tape cartridges. Each transducing means is positioned to operatively engage one of the laterally spaced magnetic information tracks of the tape contained within its associated tape cartridge when the mounting plate is in the first position. When the mounting plate is moved to a further position, each of the plurality of transducing means is positioned to operatively engage another of the laterally spaced magnetic information tracks.

3,821,815
APPARATUS FOR BATCH-FABRICATING MAGNETIC FILM HEADS AND METHOD THEREFOR

Chester D. Abbott, Longmont; George W. Brock; Neil L. Robinson, both of Boulder; Frank B. Shelledy, Longmont, and Sidney H. Smith, Broomfield, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1972, Ser. No. 296,688
Int. Cl. G11b *5/12, 5/42, 5/46*
U.S. Cl. 360—110 **10 Claims**



Magnetic heads formed of films deposited on a substrate are batch fabricated to extremely accurate throat heights by monitoring the electrical characteristics of films during material removal. A substrate carries a number of head elements each including a conductive film which serves as a drive and sense winding and also determines the gap width and throat height. The section of the conductive film which determines the throat height is initially made higher than necessary, and an additional conductor bridges two or more adjacent head elements. Leads, which normally connect the conductive film to read/write circuits, are monitored during a material removal process for electrical characteristic changes in the conductive film. For example, rough grinding progresses until the bridging conductor ruptures; and fine grinding then continues until the conductive film resistance reaches a predetermined value corresponding to the desired throat height.

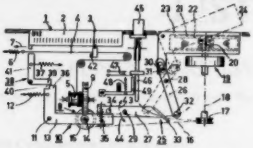
3,821,816
RECORDING AND/OR PLAYBACK APPARATUS

Gerhard Habelt, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1972, Ser. No. 232,889
Claims priority, application Austria, Mar. 8, 1971, 1960/71
Int. Cl. G11b *5/00*
U.S. Cl. 360—137 **5 Claims**

A recording and/or playback apparatus for a record carrier which is accommodated in a magazine to be placed on the ap-

paratus in an operative position. The apparatus has an indexing device having indicating means, for indicating the relative



position of the record carrier, which is capable of being set back to zero. The indicating means of the indexing device is movable against the action of a spring and can be driven via a shaft which revolves simultaneously with the movement of the record carrier and can be set back to the zero position by disengaging a spring-loaded coupling member. A cooperating actuating device is provided for shifting the disengageable member and comprises a first actuating member adapted to be moved in two opposite directions by a magazine being placed in the operative position or being removed from this position, and a cooperating movable second actuating member for disengaging the coupling member. The first actuating member only displaces the second actuating member in the direction required for disengagement of the coupling member during its displacement, which is determined by a magazine being placed in the operative position and then releases it.

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF JUNE, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Electronic Components Limited: *See*—
Harcombe, Thomas Lyn, 3,821,610.

AB Backtemans Patenter: *See*—
Backteman, Hans Ulrich; and Taylor, Richard John, 3,820,474.

Abbes, Claud; Bianchi, Santos; Chevallereau, Roger; Rogemont, Jean; Roques, Robert; Rouaud, Christian; and Royer, Henri, to Commissariat a l'Energie Atomique. Resilient metal gasket. 3,820,799, Cl. 277-164.000.

Abbott, Chester D.; Brock, George W.; Robinson, Neil L.; Shelledy, Frank B.; and Smith, Sidney H., to International Business Machines Corporation. Apparatus for batch-fabricating magnetic film heads and method therefor. 3,821,815, Cl. 360-110.000.

Abbott Laboratories: *See*—
Chittenden, Richard Marion; Whitton, Aldean William; Macalalad, Fidel Vallaluna; Massman, Richard; and Wilson, Earl David, 3,820,546.
Fry, William Grant, 3,821,436.
Geiszler, Adolph Oscar, 3,821,379.
Johnson, Robert Phillip, 3,821,365.
Paris, Gerard Yvon; and Swett, Leo Ralph, 3,821,391.

Abe, Jinnosuke; Watanabe, Tetsuo; Yamaguchi, Tsutomu; Matsumoto, Kunio; and Fujii, Tadashiro, to Toyo Jozo Company, Ltd. Process for producing 7-amino desacetoxy cephalosporanic acid. 3,821,081, Cl. 195-29.000.

Abe, Katsuhiko, to Brite Industries Inc. Expansible bracelet construction. 3,820,319, Cl. 59-79.00r.

Abe, Tetsuo: *See*—
Akashi, Hajime; Iwai, Sosuke; Fujimoto, Iwao; Hashimoto, Hiroshi; Abe, Tetsuo; Kato, Akira; and Suzuki, Masao, 3,820,623.

Abe, Wataru; Terada, Yasuyuki; and Sugafuji, Akira, to Oiles Kogyo Kabushiki Kaisha. Solid lubricant. 3,821,111, Cl. 252-12.000.

Abe, Yasunori; Yamane, Nobuo; Itoh, Kensaku; Ishida, Shuichi; and Kobayashi, Hisabumi, to Alkylthio nitrodiphenyl ethers. . 3,821,312, Cl. 260-609.00f.

Abernathy, Harlan O., 20% to Lee, Raymond, Organization, Inc., The. Toothbrush drying device. 3,820,251, Cl. 34-60.000.

Abernathy, James D.: *See*—
Marus, Louis J.; and Abernathy, James D., 3,821,699.

Abic Ltd.: *See*—
Haber, Raphael Ralph G.; and Simonovitch, Chaim, 3,821,235.

Acerra, Roger J.; Manley, Patrick J.; and Shramovich, John W. Locking system and lock therefor. 3,820,283, Cl. 49-449.000.

Ache, Rollin W.: *See*—
Ritland, Paul D.; and Ache, Rollin W., 3,820,594.

Acieries Reunies de Burbacl-Eich-Dudelange, S.A.: *See*—
Metz, Paul, 3,820,767.

Acker, Donald F.; and Klein, Dietrich J., to SCM Corporation. Ultrasonic ribbon splicer. 3,821,048, Cl. 156-73.000.

Adachi, Kohei: *See*—
Tominaga, Hiroshi; and Adachi, Kohei, 3,820,369.

Adahan, Carmeli. Air brake pressure modulator. 3,820,856, Cl. 303-21.00f.

Adams, James R.: *See*—
Reiss, Martin H.; and Adams, James R., 3,821,733.

Adams, Phillip: *See*—
Merianos, John J.; and Adams, Phillip, 3,821,407.

Adams, Stewart Sanders; Armitage, Bernard John; Nicholson, John Stuart; and Blancafort, Antonio Ribera, to Boots Company, Limited, The. 2-(4'-Chloro-4-biphenylyl) propionic acid. 3,821,293, Cl. 260-515.00a.

Adams, Willi: *See*—
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weib, Gunter, 3,821,047.

Addressograph-Multigraph Corporation: *See*—
Rosenstein, William; and Oliva, Fred P., 3,821,770.

Ade, Rolf; and Gakenholz, Werner, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Safety belt regulating apparatus. 3,821,621, Cl. 318-261.000.

Adolphi, Heinrich: *See*—
Vollrath, Robert; Boell, Walter; Scheuerer, Guenter; and Adolphi, Heinrich, 3,821,256.

Advance Biofactures Corporation: *See*—
Chiulli, Angelo J.; and Wegman, Edwin H., 3,821,364.

Aebi, Hans: *See*—
Duerr, Dieter; Aebi, Hans; and Ebner, Ludwig, 3,821,400.

Aebli, Horst; Fleck, Fritz; Kittl, Hans; and Schmid, Horst, to Sandoz Ltd., (also known as Sandoz AG). Bis-triazole compounds. 3,821,240, Cl. 260-307.00d.

Afga-Gevaert Aktiengesellschaft: *See*—
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weib, Gunter, 3,821,047.

AGA Aktiebolag: *See*—
Almqvist, Hans Olof; and Botos, Imre, 3,820,537.

Agatsuma, Kunio: *See*—
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 3,821,404.

Age Bodegas Unidas, S.A.: *See*—
Garcia, Jose M. S., 3,820,677.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bestenreiner, Friedrich; Helmberger, Josef; Meyer, Rudolf; and Meeussen, Louis Achilles, 3,820,992.
Wagner, Karl; and Wagensonner, Eduard, 3,821,765.

Agfa-Gevaert N.V.: *See*—
Mertens, Ludovicus Lucas; van den Houte, Jozef Willy; and van Royen, Freddy Ghisleen, 3,820,995.
Van Doorselaer, Marcel Karel; Danckaert, Valere Frans; and Benoy, Gaston Jacob, 3,820,991.

Aglitsky, Vladimir Efimovich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Kantor, Illya Solomonovich; Maslov, Viktor Semenovich; and Alexeev, Gennady Mikhailovich, 3,820,740.

Agmac Inc.: *See*—
Rasmussen, Carl E.; and Tiura, George O., 3,820,450.

Agushev, Vladimir Alexandrovich; Brusilovsky, Iosif Veniaminovich; Gamajunov, Alexandr Mikhailovich; Lanchikov, Konstantin Vasilievich; Sosner, Jury Moiseevich; Tsodikov, Veniamin Yakovlevich; and Judochkin, Sergei Sergeevich. Axial-flow reversible fan. 3,20,916, Cl. 415-152.000.

Aidn, Martin; Furtwangler, Gerhard; and Wanka, Eberhard, to Siemens Aktiengesellschaft. Electromagnetic relay armature mounting. 3,821,674, Cl. 335-270.000.

Aircraft Mechanics, Inc.: *See*—
King, Terrance M.; and Pearne, Frank S., 3,820,631.

Airfina Etablissements: *See*—
Zweifel, Antonio, 3,820,923.

Aisin Seiki Kabushiki Kaisha: *See*—
Nakano, Ryuzo; Yamazaki, Shinichiro; and Ogasawara, Shinzi, 3,820,192.
Sakakibara, Naoji, 3,820,624.

Aizawa, Tatsuo: *See*—
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Nihyakumen, Kouzi; Yokoyama, Taizo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,820,996.

Aizawa, Tsuneo, to Amada Company Limited. Apparatus for feeding a workpiece into cutting position on a cutting device. 3,820,773, Cl. 269-32.000.

Ajax Magnethermic Corporation: *See*—
Havas, George, 3,821,456.

Ajinomoto Co., Ltd.: *See*—
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Yoshida, Ryonosuke; Saito, Tadaomi; and Shimizu, Akira, 3,821,403.

Akashi, Goro; and Yamada, Yasuyuki, to Fuji Photo Film Co., Ltd. Magnetic recording material. 3,821,025, Cl. 117-235.000.

Akashi, Hajime; Iwai, Sosuke; Fujimoto, Iwao; Hashimoto, Hiroshi; Abe, Tetsuo; Kato, Akira; and Suzuki, Masao, to Sayno Machine Works Ltd. Method and system for speed control for vehicles. 3,820,623, Cl. 180-98.000.

Akiyama, Nobuyuki: *See*—
Nakagawa, Yasuo; and Akiyama, Nobuyuki, 3,821,545.

Aktiebolaget Asea-Atom: *See*—
Mansson, Ragnar; Nilsson, Lars; Noberius, Leif; and Sundqvist, Cnut, 3,821,078.

Aktiebolaget Atomenergi: *See*—
Mattsson, Gosta Ambjorn, 3,821,555.

Aktiebolaget Karlstads Mekaniska Werkstad: *See*—
Eriksson, Erik Sture; and Ingemarsson, Gosta Ingemar, 3,820,452.
Eriksson, Erik Sture, 3,821,073.
Stenberg, Erik Gunnar; and Emanuelsson, Ernst Ingemar, 3,821,076.

Aktiebolaget Volvo: *See*—
Johnsson, Lennart Birger Valentin, 3,820,810.

Aktieselskabet Niro Atomizer: *See*—
Houghton-Larsen, Erik; and Hansen, Ove Emil, 3,821,434.

Akzona Incorporated: *See*—
Jacoby, Charles H., 3,820,847.

Aladdin Industries, Incorporated: *See*—
Powers, William T., 3,820,791.

Alard, Francis R.: *See*—
Bolusset, Christian S.; Treheux, Michel E.; Alard, Francis R.; and Malaboeuf, Michel E., 3,820,869.

Alberny, Robert; and Leclercq, Alain, to Institut de Recherches de la Siderurgie Francaise. Method for the cooling of continuously cast product. 3,820,584, Cl. 164-89.000.

Albrecht, Ronald E.: *See—*
Griffiths, Roger O.; and Albrecht, Ronald E., 3,820,559.

Alecci, Donald E.: *See—*
Sinnott, David J.; and Alecci, Donald E., 3,821,753.

Alessio, Lucien; Chabanis, Michel; and Feraud, Claude, to Crouzet. Device for temporarily securing against motion a movable element which is resiliently biased against a withdrawable abutment. 3,820,404, Cl. 74-2.000.

Alexandrescu, Mihail: *See—*
Constantinescu, Petre B.; Barthon, Stefan; Dumitrescu, Constantin; and Alexandrescu, Mihail, 3,820,448.

Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Kantor, Illya Solomonovich; Maslov, Viktor Semenovich; and Alexeev, Gennady Mikhailovich. Plant for pneumatic transportation of goods in ontainers along a tube. 3,820,740, Cl. 243-19.000.

Alexandrovich, Eduard-Gely Vitalievich; Belkin, Nikolai Vasilievich; Zelensky, Konstantin Fedorovich; Kanunov, Mikhail Alexeevich; Razin, Anatoly Alexandrovich; Tarasova, Ljudmila Viktorovna; Toropov, Anatoly Pavlovich; Troshkin, Ivan Andreevich; Khudyakov, Ljubov Nikolaevna; Tsukerman, Veniamin Aronovich; Dron, Ninel Alexeevna; Sloeva, Galina Nikolaevna; Ioffe, Jury Konstantinovich; and Vasiliev, Vasily Vasilievich. Flash X-ray tube. 3,821,580, Cl. 313-56.000.

Alexeev, Gennady Mikhailovich: *See—*
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Kantor, Illya Solomonovich; Maslov, Viktor Semenovich; and Alexeev, Gennady Mikhailovich, 3,820,740.

Alfa Romeo S.p.A.: *See—*
Garcea, Giampaolo, 3,820,328.

Alia, Dominic Anthony, to Okonite Company, The. Electrical cable having an outer sheath with improved pyrolysis properties. 3,821,139, Cl. 260-23.00h.

Alkylthio nitrodiphenyl ethers: *See—*
Abe, Yasunori; Yamane, Nobuo; Itoh, Kensaku; Ishida, Shuichi; and Kobayashi, Hisabumi, 3,821,312.

Allegheny Ludlum Industries, Inc.: *See—*
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Allen, Maurice R., to General Electric Company. Magnetized crane rail trough- anti-contaminant trough. 3,820,466, Cl. 104-1.00r.

Allen, Thomas E.; and Pearce, Shairyl I., to Caterpillar Tractor Co. Controls for sequentially engaging transmission, torque convertor lock-up and master clutches. 3,820,417, Cl. 74-733.000.

Allgaier, Rudolf; Brambilla, Luigi; and Scholz, Hansjurgen, to Daimler-Benz Aktiengesellschaft. Discharge valve for an air bag. 3,820,814, Cl. 280-150.0ab.

Allied Chemical Corporation: *See—*
Anello, Louis G.; and Sweeney, Richard F., 3,821,290.
Bandyopadhyay, Bhaskar; Bruen, Charles P.; and Wamser, Christian A., 3,821,355.
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Allied Mineral Products, Inc.: *See—*
Magoteaux, Orville R., 3,820,978.

Allis-Chalmers Corporation: *See—*
Halbach, Edward A.; and Gallatin, Paul M., 3,821,531.

Allison, William D., to Ford Motor Company. Universal joint. 3,820,357, Cl. 64-23.000.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Larker, Hans; and Nilsson, Jan, 3,820,229.
Lindblom, Georg; and Olsson, Karl-Erik, 3,821,564.
Liss, Gote, 3,821,629.

Allmanna Svenska Elektriska Aktiebolagt: *See—*
Johansson, Arne; and Lyckstedt, Bertil, 3,821,608.

Almqvist, Hans Olof; and Botos, Imre, to AGA Aktiebolag. Self-contained underwater breathing apparatus (SCUBA). 3,820,537, Cl. 128-142.200.

Alper, Conrad H. Treatment of otitis of dogs and cats with chloramphenicol-squalane composition. 3,821,375, Cl. 424-240.000.

Alps Motorola, Inc.: *See—*
Tahara, Kumeo, 3,820,796.

Amada Company Limited: *See—*
Aizawa, Tsuneo, 3,820,773.

Amagami, Keizo; Mori, Hazime; Kobayashi, Takao; Kiuchi, Mitsuyuki; and Ogino, Yoshio to Matsushita Electric Industrial Co. Induction heating equipment having protective arrangements. 3,821,509, Cl. 219-10.770.

Amati, Werner; and Hochreuter, Richard, to Sandoz Ltd. Crease resistant finish for textiles having improved soil repellent properties. 3,821,023, Cl. 117-139.50a.

Ambrose, John; and Shepherd, Edmund J., to Dunlop Company Limited, The. Flexible hose. 3,821,050, Cl. 156-143.000.

American Bioculture, Inc.: *See—*
Bigler, E. Ray; Camp, Thomas L.; and Nelson, Perry L., 3,820,281.

American Cyanamid Company: *See—*
Castro, Francisco Carrasco; and Navarro, Carlos Badiola (said Castro assor. to), 3,821,390.
Chan, David Yee Hing, 3,821,177.
Lewis, Joseph Earle, Jr.; and Roberts, George Leathwhite, Jr., 3,821,359.
Los, Marinus, 3,821,308.
Marsico, Joseph William, Jr.; Tomcufcik, Andrew Stephen; and Goldman, Leon, 3,821,408.
Maulding, Donald Roy, 3,821,229.
Pai, Venkatrao Krishnaraya; Hyman, Daniel; and Witheford, John Maurice, 3,821,286.
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American District Telegraph Company: *See—*
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American Hoist & Derrick Company: *See—*
Juergens, Dieter C., 3,820,616.

American Home Products Corporation: *See—*
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American Hydrophilics Corporation: *See—*
McCormack, Harley G., 3,820,899.

American Optical Corporation: *See—*
Goodwin, Bertram R.; and Rotenberg, Don H., 3,821,333.

American Standard, Inc.: *See—*
Vincent, James Henry, 3,820,306.

American Telephone and Telegraph Company: *See—*
Harrington, Richard John; Low, Arnold Edward; and Sturtevant,, 3,821,485.

Amick, James L. Sailboat improvements. 3,820,493, Cl. 114-102.000.

Ammon, Harry C., to State of California, Department of Public Works. Traffic marking system. 3,820,718, Cl. 239-135.000.

AMP Incorporated: *See—*
Dechelette, Helen, 3,821,693.
Serrano, Pedro, 3,820,218.

Amperex Electronic Corporation, mesne: *See—*
Whetstone, Albert L.; Fine, Samuel; and Davis, Robert, 3,821,469.
Whetstone, Albert L.; Fine, Samuel; and Davis, Robert, 3,821,491.

Ampoules, Inc.: *See—*
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Anders, Larry E.; and Sutton, Joel F., to United Aircraft Corporation. Flap synchronizing control means. 3,820,720, Cl. 239-265.390.

Anderson, Charles H., Jr.. *See—*
Shaw, Gilbert; and Anderson, Charles H., Jr., 3,820,653.

Anderson Company, The: *See—*
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Anderson, Gordon M.: *See—*
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Anderson, James E.: *See—*
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Anderson, James Leroy: *See—*
Mishkin, Abraham Rudolph; and Anderson, James Leroy, 3,820,250.

Anderson, John Ernest, to Midland Industrial Computing Limited. Textile machines. 3,821,526, Cl. 235-151.100.

Anderson, Michael L.; Fowler, Harold Wayne; and McKie, David Alexander, to Caterpillar Tractor Co. Apparatus for skiving and cleaning reinforced hose. 3,820,421, Cl. 82-20.000.

Anderson, Paul L.; and Manning, Robert E., to Sandoz-Wander Inc. 2-Alkylthio-4,6-diamino-5-pyrimidinesulfonamides as anti-hypertensives. 3,821,380, Cl. 424-251.000.

Anderson, Terry G.: *See—*
Gaynor, Joseph; Anderson, Terry G.; Hines, Walter; and Tyler, Len A., 3,820,985.

Andreev, Oleg Semenovich; Birjukov, Boris Konstantinovich; Byzov, Yury Mikhailovich; Lekhtman, Moisei Abramovich; Perelberg, Azik Iosifovich; Strimbling, Semen Itskhovich; Trachevsky, Boris Sergeevich; Fikhman, Isak Berovich; Cherepakha, Pavel Andreevich; nd Shraifeld, Tamara Yakovlevna. Light-beam oscillograph. 3,821,749, Cl. 346-109.000.

Andres, Rudolf; Moller, Hermann; and Seyfried, Franz, to Daimler-Benz Aktiengesellschaft. Method and apparatus for detecting leakages in the vacuum system of motor vehicles. 3,820,382, Cl. 73-40.700.

Andrews, Dallas Roy: *See—*
Gordon, Franklin; and Andrews, Dallas Roy, 3,821,814.

Andrews, Hugh M. Carpet saver. 3,820,841, Cl. 297-217.000.

Andrianov, Kuzma Andrianovich: *See—*
Korshak, Vasily Vladimirovich; Andrianov, Kuzma Andrianovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Khananashvili, Lotary Mikhailovich; Vasilieva, Tatyana Vsevolodovna; Elerdashvili, Georgy Vasilievich; Gureeva, Galina Ilinichna; Kotov,Valery Mikhailovich; and Brontman, Rostislav Lazarevich, 3,821,112.

Anello, Louis G.; and Sweeney, Richard F., to Allied Chemical Corporation. Polyfluoroisoalkoxyalkyl sulfonic acids. 3,821,290, Cl. 260-513.00r.

Angliker, Hans-Joerg: *See—*
Peter, Richard; Angliker, Hans-Joerg; and Artz, Klaus, 3,821,194.

Anglo-Transvaal Consolidated Investment Company: *See—*
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Anheuser-Busch Incorporated: *See—*
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Anker-Werke AG: *See—*

Priebs, Horst; and Hecker, Alfred, 3,820,643.
Ann Arbor Terminals, Inc.: *See*—
Levine, Michael Robert, 3,821,731.
Anspach, William E., Jr.; and Bakels, Marinus. Apparatus for providing clean air at a surgical area. 3,820,536, Cl. 128-132.000.
Aoba, Toshio: *See*—
Endo, Tetsuhiko; Aoba, Toshio; Morishita, Shozo; Egami, Katsusuke; and Hagihara, Shingo, 3,820,730.
Aono, Shunji: *See*—
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Appleberry, Walter T.: *See*—
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Arai, Nobuyasu: *See*—
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Arciprete, Genio R.; and Martin, Peter G., to Little, Arthur D., Inc. Multimode search and retrieval tape system. 3,821,710, Cl. 340-172.500.
Arden, Sidney, to Consolidated Foods Corporation; d/b/a Popsicle Industries. Stabilized cocoa flavored syrups and methods of making and using the same 3,821,420, Cl. 426-45.000.
Arend, Gunter; Radlmann, Eduard; and Nischk, Gunther, to Bayer Aktiengesellschaft. Acrylonitrile-(CO)-polymers with antistatic finishes. 3,821,176, Cl. 260-85.50r.
Argoudelis, Alexander D.; and Johnson, LeRoy E., to Upjohn Company, The. Antibiotics EM2, EM3 and EM4 and process for producing same. 3,821,367, Cl. 424-119.000.
Ariyan, Zaven S.; and Harrison, William A., to Uniroyal, Inc. and Uniroyal Ltd. Pharmaceutical compositions containing a 4-aryl-2-(3-pyridyl)thiazole and methods of using same. 3,821,384, Cl. 424-263.000.
Arkell, Alfred; Schlicht, Raymond C.; and McCoy, Frederic C., to Texaco Inc. Recovery of cyclohexylbenzene hydroperoxide from reaction mixtures. 3,821,314, Cl. 260-610.00a.
Armitage, Bernard John: *See*—
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Armour and Company: *See*—
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Armstrong Cork Company: *See*—
Hensel, Robert D., 3,821,059.
Arneson, Edwin L.: *See*—
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Arnold, Benjamin Harry; Fildes, Robert Anthony; and Gilbert, David Arthur, to Glaxo Laboratories Limited. Cephalosporin derivatives. 3,821,209, Cl. 260-243.00c.
Arth, Glen E.; Sarett, Lewis H.; and Patchett, Arthur A., to Merck & Co., Inc. Chemical compositions. 3,821,374, Cl. 424-238.000.
Arthur, Jett C., Jr.; and Bains, Malkiat S., to United States of America, Agriculture. Carbohydrate-boron alkoxide compounds. 3,821,196, Cl. 260-212.000.
Artz, Klaus: *See*—
Peter, Richard; Angliker, Hans-Joerg; and Artz, Klaus, 3,821,194.
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Nobusawa, Tsukumo, 3,821,754.
Urano, Fumio; Uno, Naoyuki; Nomura, Katsuhiko; Watanabe, Koichiro; Sakazaki, Tadazumi; and Miyata, Katsuhiko, 3,821,768.
Asahina, Mitsuo: *See*—
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Asahina, Toshiro: *See*—
Tamura, Masahiko; Iwama, Kiyonori; Yamaguchi, Akira; and Asahina, Mitsuo, 3,821,492.
Asano, Takateru, to Fuji Chemicals Industrial Co., Ltd. Photo-sensitive polymers, process for producing same and compositions containing said polymers. 3,821,167, Cl. 260-49.000.
Ashkenazi, Arie: *See*—
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Ashland Oil, Inc.: *See*—
MacDonald, Ira A.; Egan, Richard R.; and Lampson, Sidney B., 3,821,442.
Askinazy, Leo. Baby carriage reciprocator. 3,820,614, Cl. 180-1.00e.
Aspin, Frank Metcalf, to Shell Oil Company. Treatment of films of plastic material. 3,820,933, Cl. 425-367.000.
Astec Industries, Inc.: *See*—
Brock, James Donald, 3,820,687.
Atherton, John: *See*—
Stables, Harry Carson; Atherton, John; and Matchan, Michael John, 3,821,208.
Atlantic Research Corporation: *See*—
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Atlantic Richfield Company: *See*—
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McKenna, William F., 3,820,939.
Audac Corporation: *See*—
Kuehnle, Manfred R., 3,820,890.
Aude, Thomas C., to Becktel International Corporation. Concept of intermediate mixing of slurries in long pipelines. 3,820,853, Cl. 302-66.000.
Auto Research Corporation: *See*—
Reeve, Paul H., 3,820,858.
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Castillo, Adolfo; Csakvary, Oscar; and Jureit, John Calvin, 3,820,502.
Automatic Switch Co., mesne: *See*—
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Bacher, Rudolph John, to Du Pont de Nemours, E. I., and Company. Cross conductors with double layered insulation. 3,821,611, Cl. 317-101.0ce.
Backteman, Hans Ulrich; and Taylor, Richard John, to AB Backtemans Patenter. Manual conlock. 3,820,474, Cl. 105-366.00b.
Badische Anilin- & Soda Fabrik Aktiengesellschaft: *See*—
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Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See*—
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Badische Anilin-Fabrik Aktiengesellschaft: *See*—
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Bahder, George; and Katz, Carlos, to Phelps Dodge Industries, Inc. Method and apparatus for accelerated testing of power cable insulation for susceptibility to treeing. 3,821,640, Cl. 324-54.000.
Bailey, Guy: *See*—
Numbers, J. L.; and Bailey, Guy, 3,820,187.
Bailey, Herbert S., to Reynolds Metals Company. Packaging machine. 3,820,304, Cl. 53-201.000.
Bailey, James R., to Switchcraft, Inc. Electrical switch unit. 3,821,533, Cl. 200-338.000.
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Baird, William G., Jr.; Holbrook, Stanley E.; and Platt, Jeremy A., to Grace, W. R., & Co. Method for preparing of film of a vinylidene chloride polymer. 3,821,182, Cl. 260-91.700.
Bakels, Marinus: *See*—
Anspach, William E., Jr.; and Bakels, Marinus, 3,820,536.
Baker Brush Co., Inc.: *See*—
Weiss, Gerhart, 3,820,850.
Baker, Donald James, Jr.; Hill, Ivan Winfield; and Wearn, Richard B., Jr., to United States of America, Navy. Deep sea pressure gauge. 3,820,391, Cl. 73-170.00a.
Baker, John W. Precision cutting tool. 3,820,233, Cl. 29-566.000.
Baker, Walter, Jr., to General Electric Comapny. Air conditioner grille assembly. 3,820,351, Cl. 62-267.000.
Bakker, Lynn A.: *See*—
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Bakker, Willem F., to Metex Corporation. Electromagnetic shielding material. 3,821,463, Cl. 174-35.0ms.
Bako, Lazlo; and Heine, Henry, to Presto Lock Co.; Division of Kidde, Walter, & Company, Inc. Buckle combination lock. 3,820,363, Cl. 70-312.000.
Balasubramanian, N.: *See*—
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Balch, James L.; Anderson, James E.; and Schroeder, Charles J., to Mayer, Oscar, & Co. Inc. Method and apparatus for manufacturing container lids having transparent windows. 3,820,219, Cl. 29-208.00r.
Baldwin, Raymond C.: *See*—
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Baldwin, Willis H., to United States of America, Atomic Energy Commission. Production of high purity halides. 3,821,356, Cl. 423-250.000.
Baldy, Jean, to U. S. Philips Corporation. Method of manufacturing a piezoelectric element. 3,820,208, Cl. 29-25.350.
Balint, Istvan; and Baumann, Sandor, to Licencia Talalmanyokat Ertekesito Vallalat. High-safety complex lift with electronic collective control. 3,820,625, Cl. 187-24.00r.
Ballard, Billy G.: *See*—

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Bandag Incorporated: *See—*
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Bandakov, Leonid Fedorovich: *See—*
Vanjushin, Sergei Petrovich; and Bandakov, Leonid Fedorovich, 3,820,543.

Bandyopadhyay, Bhaskar; Bruen, Charles P.; and Wamser, Christian A., to Allied Chemical Corporation. Recovery of sulfur and metal values from sulfur bearing minerals. 3,821,355, Cl. 423-139.000.

Baranwal, Krishna C.: *See—*
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Barber, Patrick A.; and Cleveland, Bruce B., to Upjohn Company, The. Apparatus and method for thermally insulating an oil well. 3,820,605, Cl. 166-315.000.

Barbier, Jean France L. P.; and Renard, Guy, to Eastman Kodak Company. Direct-positive photographic elements and processes for preparing direct-positive silver halide emulsions. 3,820,998, Cl. 96-64.000.

Bardenhagen, Dietrich: *See—*
Schubert, Bernhard; and Bardenhagen, Dietrich, 3,820,671.

Barenyi, Bela: *See—*
Wilfert, Karl; and Barenyi, Bela, 3,820,834.

Barnard, Ralston White, to Bell Telephone Laboratories, Incorporated. Slotted electrical connector of copper-based alloy separated from an indium coating by a barrier layer. 3,821,692, Cl. 339-97.00p.

Barnes, Murphy L., Jr.: *See—*
Kern, Hall S.; and Barnes, Murphy L., Jr., 3,820,170.

Barnhart, James W.; and Shea, Philip J., to Dow Chemical Company, The. Reduction of serum cholesterol levels with the dimethyl acetal of 1-(2,4-di-sec-butylphenoxy)-2-propanone. 3,821,411, Cl. 424-341.000.

Barron, Benny Gene; and Dunlap, James Ray, to Dow Chemical Company, The. Air frothed polyurethane foams. 3,821,130, Cl. 260-2.5bd.

Barron, William E., to Bethlehem Steel Corporation. Coke oven pusher machine leveler bar seal. 3,821,088, Cl. 202-269.000.

Barry, John K., to Southco Inc. Blind stud fastener. 3,820,579, Cl. 151-41.730.

Bartalini, Gastone; and Giuggioli, Mario, to Montedison Fibre S.p.A. Process for the manufacture of hexamethylenediamine. 3,821,305, Cl. 260-583.00k.

Barthon, Stefan: *See—*
Constantinescu, Petre B.; Barthon, Stefan; Dumitrescu, Constantin; and Alexandrescu, Mihail, 3,820,448.

Basf Aktiengesellschaft: *See—*
Koenig, Horst; Metzger, Horst; and Reif, Werner, 3,821,277.

Baskin, H. H., Jr.: *See—*
Shiffler, George M.; and Baskin, H. H., Jr., 3,820,285.

Bateson, Norman E.; and Pringle, William L., to Pullman Incorporated. Truss-type cargo-carrying vehicle. 3,820,747, Cl. 244-118.000.

Batley, William R., Jr., to Batley, William R., Jr., mesne. Pet litter produced by recycled molasses serum. 3,821,346, Cl. 264-115.000.

Batley, William R., Jr., mesne: *See—*
Batley, William R., Jr., 3,821,346.

Battista, Orlando A., to Avicon, Inc., mesne. Pharmaceutical compositions containing microcrystalline collagen, a water-insoluble, ionizable, partial salt of collagen. 3,821,371, Cl. 424-145.000.

Batzer, Hans: *See—*
Habermeier, Juergen; Batzer, Hans; and Porret, Daniel, 3,821,242.
Lohse, Friedrich; Schmid, Rolf; and Batzer, Hans, 3,821,165.

Baudhuin, George J., to Beatrice Foods Co. Cherry pit flour consisting of finely ground cherry hulls and cherry kernels. 3,821,431, Cl. 426-148.000.

Bauer, Benjamin B., to CBS, Inc. Apparatus for reproducing quadruphonic sound. 3,821,471, Cl. 179-1.0gq.

Bauer, George T., to Xerox Corporation. Instrument for scanning document for quality. 3,820,900, Cl. 356-200.000.

Bauer, Peter, to Bowles Fluidics Corporation. Fluidic oscillator for providing dynamic liquid spray patterns. 3,820,716, Cl. 239-102.000.

Baugh, Hollis A., to Stewart, C. Jim, & Stevenson, Inc. Underwater wellhead connector. 3,820,600, Cl. 166-.600.

Bauman, John H.: *See—*
Gilford, Saul R.; Freeman, Gary M.; and Bauman, John H., 3,820,530.

Baumann, Sandor: *See—*
Balint, Istvan; and Baumann, Sandor, 3,820,625.

Baxter, Meriwether L., to Gleason Works, The. Gear tooth design. 3,820,414, Cl. 74-462.000.

Bayard, Gaston. Devices for the regulation of a gas-turbine turbomachine of low power. 3,820,322, Cl. 60-39.300.

Bayer Aktiengesellschaft: *See—*
Arend, Gunter; Radlmann, Eduard; and Nischk, Gunther, 3,821,176.
Blahak, Johannes; Muller, Erwin; Mott, Ludwig; and Schwinum, Ernst, 3,821,282.
Boshagen, Horst; and Plempel, Manfred, 3,821,385.
Dietzel, Karl; Peilstocker, Gunter; Meyer, Karl-Heinrich; and Streib, Hugo, 3,821,071.
Kishino, Shigeo; Kudamatsu, Akio; Shiokawa, Kozo; and Yamaguchi, Shinich, 3,821,246.
Mansmann, Manfred; and Winter, Gerhard, 3,821,070.
Muller, Karl-Heinz; Rohr, Harry; and Ott, Karl-Heinz, 3,821,157.
Radlmann, Eduard; and Nischk, Gunther, 3,821,281.
Reiff, Helmut, 3,821,313.
Schwarz, Hans Helmut; Immel, Otto; and Schnell, Hermann, 3,821,202.
Vernaleken, Hugo; Lange, Ralf; Schnell, Hermann; and Schwarz, Hans-Helmut, 3,821,294.

Bayer, Horst O.; Cook, Richard S.; and Von Meyer, William C., to Rohm & Haas Company. Fungicidal use of a 1,2,4-triazole nickel salt complex. 3,821,376, Cl. 424-245.000.

Bays, Philip Arthur, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for the Environment in Her Brittanic Majesty's Government of the. Marking of carriageways. 3,820,911, Cl. 404-11.000.

BBC Brown, Boveri & Company Limited: *See—*
Hartmann, Hans; Krieter, Georg-Heinz; and Mauthe, Gerhard, 3,821,687.
Muz, Edwin, 3,821,595.
Schwarzenbach, Alfred, 3,820,336.

Beal, Philip F., III; and Pike, John E., to Upjohn Company, The. Dihydro PGA. 3,821,280, Cl. 260-468.00d.

Beale, Julian Robert Anthony, to U.S. Philips Corporation. Electroluminescent semiconductor devices. 3,821,774, Cl. 357-17.000.

Beall, Ninian, Jr., to Monarch Marking Systems, Inc. Composite web of record assemblies. 3,820,261, Cl. 40-2.000.

Beals, Wayne D. Nailing machine. 3,820,705, Cl. 227-113.000.

Beaston, Bud A. Locking device for trailer hitches. 3,820,823, Cl. 280-512.000.

Beaton, Daniel Harper, to Du Pont de Nemours, E. I., and Company. Continuous, solid-phase polymerization of polyamide granules. 3,821,171, Cl. 260-78.0sc.

Beatrice Foods Co.: *See—*
Baudhuin, George J., 3,821,431.

Beatrice Foods Company: *See—*
Kennedy, James D., 3,820,852.

Beaver, Dale H. Hoop rolling and braking device. 3,820,277, Cl. 46-220.000.

Bebinger, Jack E., to Westinghouse Electric Corporation. Panel and trim assembly. 3,820,296, Cl. 52-614.000.

Beck, Charles E.; and Zatyko, D. Richard, to General Electric Company. Stabilization of mercury-vapor discharge lamps. 3,821,578, Cl. 313-44.000.

Beck, Maurice Sidney; Calvert, George; Mendies, Patrick John; and Cunlifee, Malcolm, to Fielden Electronics Limited. Measurement of flow in a hydraulic system. 3,820,392, Cl. 73-194.00e.

Becker, John E., to Cluaran Associated Ltd. Vented hydraulic coupling. 3,820,329, Cl. 60-336.000.

Beckett, R. W., Corporation: *See—*
De Lancey, Warren H.; and Cooperridge, Myron T., 3,820,943.

Becktel International Corporation: *See—*
Aude, Thomas C., 3,820,853.

Beecham Group Limited: *See—*
Dixon, Harold, 3,821,124.
Heyes, James; and Ward, Neal, 3,821,415.
Jansen, Gert Peter, 3,821,250.

Beekhuis, Gerrit E.; and Klein, Joseph F. M., to Stamicarbon N.V. Process for preparing 2-(β-cyanoethylo)-N-substituted acetaldimines. 3,821,274, Cl. 260-464.000.

Beeson, Harry E., to Evans Products Company. Side sway brace for gondola bulkhead. 3,820,475, Cl. 105-376.000.

Begemann, Willem Johan; and Harkes, Pieter Daniel, to Lever Brothers Company. Process for the flavouring of foods. 3,821,421, Cl. 426-65.000.

Belanger, Inc.: *See—*
Belanger, James A., 3,820,291.

Belanger, James A., to Belanger, Inc. Replaceable hinge type abrasive units or packs for cylindrical hub structures. 3,820,291, Cl. 51-334.000.

Belkin, Nikolai Vasilievich: *See—*
Alexandrovich, Eduard-Gely Vitalievich; Belkin, Nikolai Vasilievich; Zelensky, Konstantin Fedorovich; Kanunov, Mikhail Alexeevich; Razin, Anatoly Alexandrovich; Tarasova, Ljudmila Viktorovna; Toropov, Anatoly Pavlovich; Troshkin, Ivan Andreevich; Khudyakov, Ljubov Nikolaevna; Tsukerman, Veniamin Aronovich; Dron, Ninel Alexeevna; Sloeva, Galina Nikolaevna; Ioffe, Jury Konstantinovich; and Vasiliev, Vasily Vasilievich, 3,821,580.

Bell & Howell Company: *See—*
Corrigan, Richard A., 3,821,762.
Gaynor, Joseph; Anderson, Terry G.; Hines, Walter; and Tyler, Len A., 3,820,985.
Mateja, Eugene V., 3,821,622.
Pietenpol, William J., 3,821,519.

Bell Telephone Laboratories, Incorporated: *See—*
Barnard, Ralston White, 3,821,692.
DeWinter, John Christian; Leheny, Robert Francis; Nahory, Robert Edward; Shah. Jagdeep Chandravadan; and Shaklee, Kerry Lee, 3,821,662.
Duff, Thomas Guy, 3,821,495.
Gloge, Detlef Christoph, 3,821,549.
Hirsch, Peter, 3,821,482.
Kreuzer, Lloyd Barton, 3,820,901.

Mussman, Harry Edward, 3,821,486.

Bendix Corporation, The: *See*—
Harnich, Eugene E., 3,820,554.
Ludwig, Carl H., 3,821,659.
Powell, Barry K., 3,820,622.

Benkoe, Erwin: *See*—
Goldfarb, Adolph E.; and Benkoe, Erwin, 3,820,276.
Goldfarb, Adolph E.; and Benkoe, Erwin, 3,820,788.

Benner, Wolfgang. Ski binding. 3,820,804, Cl. 280-11.35t.

Bennett, Donald R.; and Levier, Robert R., to Dow Corning Corporation. Organosilicon compositions in methods of treatment involving increasing the dopamine content of the brain. 3,821,373, Cl. 424-184.000.

Bennett, Melvin T.; Vlach, Thomas L.; Edwin, Allan I.; and Venturi, Gino, to Interactive Systems, Inc. Computer system. 3,821,706, Cl. 340-163.000.

Benoy, Gaston Jacob: *See*—
Van Doorselaer, Marcel Karel; Danckaert, Valere Frans; and Benoy, Gaston Jacob, 3,820,991.

Bentley, Mona Lilian. Swimming aids. 3,820,178, Cl. 9-337.000.

Benz & Hilgers GmbH, mesne: *See*—
Reinecke, Gunter; and Linke, Dietrich, 3,820,300.

Berg, Albert T., Jr.; and Langlie, Howard. Electric fence insulator for T-shaped posts. 3,820,758, Cl. 256-10.000.

Berg, Christoph, to Sartorius-Werke GmbH. Method of digitally squaring the ratio of two frequencies. 3,821,536, Cl. 235-160.000.

Bergenthal, Eckhard J., to Caddy Corporation. Article support stand. 3,820,478, Cl. 108-136.000.

Berger, Abe, to General Electric Company. Nitrogen-containing organosilicon materials. 3,821,218, Cl. 260-248.0ns.

Beringer, Monique: *See*—
Buchmann, Paul; and Beringer, Monique, 3,820,548.

Berker, Karl-August: *See*—
Bittner, Wolfgang; Berker, Karl-August; and Claes, Gunter, 3,820,597.

Berndt, Neil R.: *See*—
Morren, George J.; and Berndt, Neil R., 3,820,343.

Berntson, Leslie G.: *See*—
Blackley, William D.; and Berntson, Leslie G., 3,821,150.

Berth, Peter, to Therachemie Chemisch Therapectische Gesellschaft m.b.H. Process of dyeing human hair based on pyrazolone compounds. 3,820,948, Cl. 8-10.200.

Bertrand, Hans: *See*—
Limque, Ferdinand; Bertrand, Hans; and Bielefeldt, Irvin P., 3,820,766.

Bertus, Brent J., to Phillips Petroleum Company. Oxidative dehydrogenation processes. 3,821,324, Cl. 260-680.00e.

Besseyre, Jacques A., to International Business Machines Corporation. Digital echo suppressor with direct table look-up control by delta coded signals. 3,821,494, Cl. 179-170.600.

Bessiere, Pierre Etienne, to Societe Labavia-S.G.E. Eddy current brakes. 3,821,572, Cl. 310-93.000.

Best, Anthony: *See*—
Moulton, Alexander Eric; and Best, Anthony, 3,820,813.

Best, Walter E. High-security hasp lock. 3,820,360, Cl. 70-6.000.

Bestenreiner, Friedrich; Helmberger, Josef; Meyer, Rudolf; and Meeussen, Louis Achilles, to Agfa-Gevaert Aktiengesellschaft. Method and apparatus for recording color picture information on photographic material. 3,820,992, Cl. 96-27.00e.

Beta Industries, Inc.: *See*—
Mize, John L., 3,821,773.

Bethlehem Steel Corporation: *See*—
Barron, William E., 3,821,088.

Betke, Adolf C., to Litton Industrial Products, Inc. Circuit for shifting the phase of a sine wave by differential means. 3,821,631, Cl. 321-40.000.

Betsudan, Shinichi: *See*—
Mizusawa, Motoo; Takeichi, Yoshihiro; and Betsudan, Shinichi, 3,821,746.

Betz Laboratories, Inc.: *See*—
Brink, Robert H., Jr.; Shema, Bernard F.; and Swered, Paul, 3,821,369.
Shema, Bernard F.; Brink, Robert H., Jr.; and Justice, Roger L., 3,821,396.

Bhakuni, Roop S.; and Morgan, John G., to Goodyear Tire & Rubber Company, The. Process for treating tire cord fabric and improved rubber structures therefrom. 3,821,017, Cl. 117-76.00t.

Bianchi, Santos: *See*—
Abbes, Claud; Bianchi, Santos; Chevallereau, Roger; Rogemont, Jean; Roques, Robert; Rouaud, Christian; and Royer, Henri, 3,820,799.

Biard, James R., to Spectronics, Incorporated. Edge emission gas light emitter structure. 3,821,775, Cl. 357-17.000.

Bickford, William J.; Rowland, Howard J.; and Tsao, Carson K. H., to Raytheon Company. Scatter communication system. 3,821,646, Cl. 325-56.000.

Bielefeldt, Irvin P.: *See*—
Limque, Ferdinand; Bertrand, Hans; and Bielefeldt, Irvin P., 3,820,766.

Bigland, Christopher Hedley: *See*—
Trevoy, Lloyd Woodbury; Greenfield, Jeremy; Bigland, Christopher Hedley; Milligan, James Douglas; and Moisey, John Roman, 3,821,412.

Bigler, E. Ray; Camp, Thomas L.; and Nelson, Perry L., to American Bioculture, Inc. Pre-germination seed treatment. 3,820,281, Cl. 47-58.000.

Bilal, Abdel-Latif; Metscher, Klaus; and Zimen, Karl-Erik, to Hahn-Meitner-Institut fur Kernforschung Berlin GmbH. Method of separating plutonium from uranium and from other transuranium elements. 3,821,091, Cl. 204-1.500.

Billiteri, Philip: *See*—
Ivkovich, John C.; and Billiteri, Philip, 3,820,819.

Bills, Alan M., to Westvaco Corporation. C21-Dicarboxylic acid anhydride and size agents and sizing process. 3,821,075, Cl. 162-179.000.

Biorex Laboratories Limited: *See*—
Turner, John Cameron; and Chan, Rosalind Po-Kuen, 3,821,319.

Birjukov, Boris Konstantinovich: *See*—
Andreev, Oleg Semenovich; Birjukov, Boris Konstantinovich; Byzov, Yury Mikhailovich; Lekhtman, Moisei Abramovich; Perelberg, Azik Iosifovich; Strimbling, Semen Itskhovich; Trachevsky, Boris Sergeevich; Fikhman, Isak Berovich; Cherepakha, Pavel Andreevich; nd Shraifeld, Tamara Yakovlevna, 3,821,749.

Birkenshaw, James R.: *See*—
Leonard, Thomas R.; and Birkenshaw, James R., 3,820,749.

Birkestrand, Orville J.; and Haas, John L., to Collins Machinery Corporation. Automatic lever controlled die head. 3,820,180, Cl. 10-94.000.

Bishop, Clifford F.: *See*—
Isaac, Donald, Jr.; and Bishop, Clifford F., 3,821,532.

Bishop, Thomas Desmond, to Deritend Engineering Company Limited, The. Sheet delivery apparatus. 3,820,779, Cl. 271-180.000.

Bittner, Wolfgang; Berker, Karl-August; and Claes, Gunter, to Gunther Papenmier KG Maschinen- und Apparatebau. Mixer having a device for cooling of material to be mixed. 3,820,597, Cl. 165-109.000.

Black, Archie Scott; and Feinstone, Wolffe Harry. Sunscreen preparation employing ethylenemaleic anhydride copolymers. 3,821,363, Cl. 424-59.000.

Blackley, William D.; and Berntson, Leslie G., to Minnesota Mining and Manufacturing Company. Method for improving the surface of thermoset coatings. 3,821,150, Cl. 260-31.600.

Blackmore, Fred N.; Blackmore, Fred N., Jr.; and Trachet, John R. Apparatus for transplanting plants. 3,820,480, Cl. 111-2.000.

Blackmore, Fred N., Jr.: *See*—
Blackmore, Fred N.; Blackmore, Fred N., Jr.; and Trachet, John R., 3,820,480.

Blahak, Johannes; Muller, Erwin; Mott, Ludwig; and Schwinum, Ernst, to Bayer Aktiengesellschaft. Polymerisable anthranilic acid esters. 3,821,282, Cl. 260-471.00r.

Blair, Edgar Allan: *See*—
Hudgin, Donald Edward; and Blair, Edgar Allan, 3,821,136.

Blake, Anthony; and Pendlington, Sidney, to Lever Brothers Company. Dehydrated vegetables. 3,821,435, Cl. 426-199.000.

Blancafort, Antonio Ribera: *See*—
Adams, Stewart Sanders; Armitage, Bernard John; Nicholson, John Stuart; and Blancafort, Antonio Ribera, 3,821,293.

Blickensderfer, Robert: *See*—
Copeland, Mark I.; O'Brien, William L.; and Blickensderfer, Robert, 3,821,036.

Bljumberg, Erna Albertovna; Ivanjukov, Demid Vasilievich; Maslov, Sergei Alexeevich; Norikov, Jury Dmitrievich; Emanuel, Nikolai Markovich; and Boiko, Vladimir Vasilievich. Method of simultaneous production of olefine oxides and acetic acid. 3,821,259, Cl.260-348.50v.

Bloch, Herman S.: *See*—
Massie, Stephen N.; and Bloch, Herman S., 3,821,315.

Blonar, James A. Body tilting mechanism. 3,820,809, Cl. 280-91.000.

Bloom, Stanley M.: *See*—
Land, Edwin H.; Bloom, Stanley M.; and Farney, Leonard C., 3,821,000.

Blumbergs, John H.; and Finley, Joseph H., to FMC Corporation. Method of producing the trisodium salt of carboxy Methyloxysuccinic acid. 3,821,296, Cl. 260-535.00p.

Boaz, Virgil L., to Westinghouse Electric Corporation. Transformer having magnetic shields. 3,821,677, Cl. 336-84.000.

Bobard, Emile, to Bobard Jeune. Self-propelled vehicle with wheel-gauge adjustable during operation. 3,820,615, Cl. 180-1.00f.

Bobard Jeune: *See*—
Bobard, Emile, 3,820,615.

Bobb, Lloyd J., to Pond, Chester C. Electroacoustic transducer especially electrostatic speakers and systems. 3,821,490, Cl. 179-111.00r.

Bochis, Richard J.: *See*—
Mrozik, Helmut H.; and Bochis, Richard J., 3,821,276.

Bock, Otto, Orthopadische Industrie KG, Firma: *See*—
Horvath, Eduard, 3,820,168.

Boehringer Ingelheim, GmbH: *See*—
Franz, Helmut, 3,820,698.

Boelkins, Wallace G., to Uni-Mist, Inc. Quick disconnect coupling for coaxial fluid lines. 3,820,827, Cl. 285-133.00r.

Boell, Walter: *See*—
Vollrath, Robert; Boell, Walter; Scheuerer, Guenter; and Adolphi, Heinrich, 3,821,256.

Bogatin, Irvin: *See*—
Marus, Louis J.; and Abernathy, James D. (said Abernathy assor. of 12.6% to), 3,821,699.

Bogie, Nelson H. Ring screen crusher. 3,820,725, Cl. 241-76.000.

Bogner, Richard D., to CCA Electronics. Transmitting antenna employing parasitic end-fire directors. 3,821,745, Cl. 343-770.000.

Bogrets, German Nikolaevich; Semenov, Oleg Alexeevich; Dudkin, Vyacheslav Fedorovich; and Vorontsov, Anatoly Konstantinovich. Apparatus for making profiled articles. 3,820,969, Cl. 65-184.000.

Bohmer, William. Scanner devices utilizing field effect light scattering dielectrics. 3,820,875, Cl. 350-160.0lc.

Boik, Elmer J.: *See—*
Zipper, Donald H.; and Boik, Elmer J., 3,820,678.

Boiko, Vladimir Vasilievich: *See—*
Bljumberg, Erna Albertovna; Ivanjukov, Demid Vasilievich; Maslov, Sergei Alexeevich; Norikov, Jury Dmitrievich; Emanuel, Nikolai Markovich; and Boiko, Vladimir Vasilievich, 3,821,259.

Boitano, Robert A.; and Engle, Charles J., to Gared Corporation. Collapsible basketball goal. 3,820,784, Cl. 273-1.50r.

Boivin, Louis-Philippe: *See—*
Kosman, Karel Jan Williams; and Boivin, Louis-Philippe, 3,821,590.

Bolusset, Christian S.; Treheux, Michel E.; Alard, Francis R.; and Malaboeuf, Michel E. Focussed image holographic memory. 3,820,869, Cl. 350-3.500.

Bone Cravens Limited: *See—*
Worthington, Victor, 3,820,932.

Bonneaud, Henri Auguste; and Hoch, Rene Gerard, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Method of and device for attenuating the noise produced by a jet engine nozzle. 3,820,626, Cl. 181-33.0hc.

Boots Company, Limited, The: *See—*
Adams, Stewart Sanders; Armitage, Bernard John; Nicholson, John Stuart; and Blancafort, Antonio Ribera, 3,821,293.

Borbat, Vladimir Fedorovich: *See—*
Lishevskaya, Marina Osipovna; Virnik, Alexandr Davidovich; Gabrielian, Genrikh Aramaisovich; Rogovin, Zakhar Alexandrovich; Borbat, Vladimir Fedorovich; Orlov, Alexandr Mikhailovich; Ferberg, Mirriam Borisovna; and Markelova, Nina Ivanovna, 3,821,137.

Borck, Joachim: *See—*
Koppe, Volker; Schulte, Karl; Borck, Joachim; Poetsch, Eike; and Muller-Calgan, Helmut, 3,821,234.

Borden, A. Gale. Waste disposal assembly and process for treating same. 3,821,106, Cl. 210-1.000.

Borden, Inc.: *See—*
Petke, Frederick E., 3,821,138.

Borden, Inc., mesne: *See—*
Buckwalter, Geoffrey R., 3,821,190.

Bordt, Guillermo German: *See—*
Parker, Wilbur Allen; Bordt, Guillermo German; and Larsen, Holger, 3,821,448.

Borst, Gaylord M.; and Fuelling, William, Jr., to Outboard Marine Corporation. Tiller mounted clutch and throttle control. 3,820,641, Cl. 192-.098.

Bosch, Robert, Fernsehandagen GmbH: *See—*
Siegel, Emil, 3,821,592.

Bosch, Robert, G.m.b.H.: *See—*
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Wahl, Karl-Heinz, 3,821,524.
Ziener, Hermann; Weber, Lothar; Jahnke, Horst; Magenau, Horst; and Zimmermann, Georg, 3,821,028.

Bosch, Robert, G.m.b.H., Gerlingen-Schillerhoehe: *See—*
Schnaibel, Eberhard; and Gotz, Werner, 3,820,857.

Boschei, Vittorio, to Grafosol S.p.A. Double-reel apparatus for electrostatically producing copies and matrices. 3,820,892, Cl. 355-13.000.

Boshagen, Horst; and Plempel, Manfred, to Bayer Aktiengesellschaft. Thiocarbamic acid derivatives for treating mycotic infections. 3,821,385, Cl. 424-258.000.

Bosshard, Otto, to Zellweger Ltd. Indentification member. 3,820,498, Cl. 116-114.00r.

Bostick, William Derry; and Carr, Peter William, to Research Corporation. Blood coagulation timer. 3,821,643, Cl. 324-65.00r.

Boston Insulated & Cable Co.: *See—*
Toomajanian, Vasken R., 3,820,927.

Bostrom, Sture; and Nordstrom, Gert, to Robacks Medaniska Verkstad Bostrom & Soner. Mobile concrete station. 3,820,762, Cl. 259-154.000.

Boto, Louis; and Rodger, David B., to United States Steel Corporation. Insulation for water-cooled pipes in a reheating furnace. 3,820,947, Cl. 432-234.000.

Botos, Imre: *See—*
Almqvist, Hans Olof; and Botos, Imre, 3,820,537.

Boughton, Julius. Power door lock. 3,820,284, Cl. 49-449.000.

Boutfille, Daniel. Pneumatic memory relay. 3,820,567, Cl. 137-625.660.

Bowen, Braxton Cates, to Du Pont de Nemours, E. I., and Company. Apparatus for detecting wraps on processing rolls. 3,820,699, Cl. 226-43.000.

Bowles Fluidics Corporation: *See—*
Bauer, Peter, 3,820,716.

Bowling, Teamus, to General Electric Company. Thermal switch. 3,821,683, Cl. 337-386.000.

Bowman, Bobby R.: *See—*
Drelich, Arthur H.; and Bowman, Bobby R., 3,821,146.

Boyd, William A.: *See—*
Morse, Lewis D.; Hammes, Paul A.; and Boyd, William A., 3,821,422.

Bozanic, Donald A.; Mergerian, Dickron; and Minarik, Ronald W., to Westinghouse Electric Corporation. Generation of repetitive spin echoes in rutile. 3,821,636, Cl. 324-6.50r.

BP Chemicals International Limited: *See—*
Westermann, Peter Henry; and Fogg, Sidney George, 3,821,158.

Braca, Joseph F.; and Hynes, John E., to Pitney-Bowes, Inc. Magnetically codable machine readable polymeric article. 3,821,060, Cl. 161-39.000.

Brackett, George E. Method and apparatus for power transmission utilizing a worm drive. 3,820,413, Cl. 74-425.000.

Bradus, Robert; Bruder, Edward A.; and Rogers, Frederick, to Singer Company, The. Pattern cam follower throw-out mechanism for sewing machines. 3,820,485, Cl. 112-158.00a.

Braeuer, Hans; and Brinkhoff, Hans. Magnesium orotate glycinate and its complex compound with magnesium glycinate and their preparation. 3,821,224, Cl. 260-260.000.

Braeuninger, Karl F., to Dow Chemical Company, The. Mandrel for extruding tubing. 3,820,374, Cl. 72-265.000.

Brambilla, Luigi: *See—*
Allgaier, Rudolf; Brambilla, Luigi; and Scholz, Hansjurgen, 3,820,814.

Brandestini, Antonio: *See—*
Brandestini, Antonio; Siegwart, Hans Rudolf; and Kaser, Rene (said Siegwart and said Kaser assors. to said), 3,820,832.

Brandestini, Antonio; Siegwart, Hans Rudolf; and Kaser, Rene, said Siegwart and said Kaser assors. to said Brandestini, Antonio. Anchoring device for wire strands in prestressed concrete structures. 3,820,832, Cl. 24-115.00a.

Brandin, Tore; and Lundberg, Anders, to Stal Refrigeration AB. Rotary compressor with oil cooling. 3,820,350, Cl. 62-193.000.

Bratkowski, Walter V.; and Fischer, William H., to Westinghouse Electric Corporation. Circuit interrupters utilizing supersonic flow. 3,821,507, Cl. 200-148.00r.

Brechbuhler, Hans Ulrich; and Gubler, Kurt, to Ciba-Geigy Corporation. 1-Morpholino-1-cyano-O-carbamoyl-formoximes. 3,821,217, Cl. 260-247.20a.

Brecht, Heinz. Apparatus for laying pipe. 3,820,345, Cl. 61-41.00a.

Breece, Jean; and Brown, Michael, to Carter-Wallace, Inc. Effervescent tablet. 3,821,117, Cl. 252-99.000.

Breitschwerdt, Werner; and Renner, Hermann, to Daimler-Benz Aktiengesellschaft. Safety instrument panel. 3,820,621, Cl. 180-90.000.

Breitwieser, Roland: *See—*
Kaufman, Warner B.; and Breitwieser, Roland, 3,821,462.

Brenan, Robert R., to GTE Sylvania Incorporated. Method for forming composite wire. 3,820,232, Cl. 29-474.400.

Brendel, Gottfried J.; and Shepherd, Lawrence H., Jr., to Ethyl Corporation. Secondary alkenols prepared from aluminum compounds. 3,821,318, Cl. 260-632.00r.

Brenner, Charles H., to Motorola, Inc. Integral reflecting cavity semiconductor pumped laser. 3,821,663, Cl. 331-94.50r.

Bressel, Ulrich; Fuchs, Werner; and Platz, Rolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Oxidative dehydrogenation of methyl issbutyrate. 3,821,287, Cl. 260-486.00d.

Bretschneider, Hermann; Hohenlohe-Oehringen, Kraft; Grussner, Andre; and Nedden, Klaus Zur, to Hoffmann-La Roche Inc. Substituted sulfonyl bornane-carboxamides and norbornane carboxamides. 3,821,230, Cl. 260-293.560.

Brico Engineering Limited: *See—*
Kent, Peter Michael, 3,820,213.

Bridgestone Liquefied Gas Company Limited: *See—*
Yamamoto, Katsuro, 3,820,492.

Bridgestone Liquefied Gas Company, Ltd.: *See—*
Yamamoto, Katsuro, 3,820,491.

Bridgestone Tire Comapny Limited: *See—*
Ueda, Shigeo, 3,820,495.

Briley, Thomas S. Manually rotated antennae utilizing a flexible cable and a pin locking mechanism. 3,821,744, Cl. 343-763.000.

Brill, Murray I. Soil testing apparatus and method. 3,820,384, Cl. 73-84.000.

Brink, Robert H., Jr.: *See—*
Shema, Bernard F.; Brink, Robert H., Jr.; and Justice, Roger L., 3,821,396.

Brink, Robert H., Jr.; Shema, Bernard F.; and Swered, Paul, to Betz Laboratories, Inc. Biocidal compositions containing copper compounds. 3,821,369, Cl. 424-141.000.

Brinkhoff, Hans: *See—*
Braeuer, Hans; and Brinkhoff, Hans, 3,821,224.

Brite Industries Inc.: *See—*
Abe, Katsuhiko, 3,820,319.

Broadhurst, Dennis; and Moore, Brian B., to International Business Machines Corporation. Multiple-station receiver-controlled transmission loop interface for data transfer and control between data processing systems and subsystems. 3,821,713, Cl. 340-172.50.

Brock, George W.: *See—*
Abbott, Chester D.; Brock, George W.; Robinson, Neil L.; Shelledy, Frank B.; and Smith, Sidney H., 3,821,815.

Brock, James Donald, to Astec Industries, Inc. Apparatus for providing a non-reacting atmosphere with a storage bin. 3,820,687, Cl. 222-53.000.

Brockmuller, Brigitte: *See—*
Papst, Josef; and Brockmuller, Brigitte, 3,820,561.

Brontman, Rostislav Lazarevich: *See—*

Korshak, Vasily Vladimirovich; Andrianov, Kuzma Andrianovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Khananashvili, Lotary Mikhailovich; Vasilieva, Tatyana Vsevolodovna; Elerdashvili, Georgy Vasilievich; Gureeva, Galina Ilinichna; Kotov,Valery Mikhailovich; and Brontman, Rostislav Lazarevich, 3,821,112.

Brooks, David N.: *See*—
Kimball, Stephen F.; Warren, Bernard J.; and Brooks, David N., 3,821,685.

Brown, Albert D., to Highway Traffic and Safety Corporation. Visual landing and surface guidance apparatus. 3,821,697, Cl. 340-26.000.

Brown, Edgar D., Jr., to General Electric Company. Hydrocarbonoxy-containing silicone fluids useful as hydraulic fluids. 3,821,114, Cl. 252-78.000.

Brown, Felix H., to Owens-Illinois, Inc. Recording of information from gaseous discharge display/memory panel. 3,821,748, Cl. 346-74.00p.

Brown, Michael: *See*—
Breece, Jean; and Brown, Michael, 3,821,117.

Brown, Roger A. Electro magnetic, super-cooled bearing. 3,820,859, Cl. 308-10.000.

Brown, William D., to University of California, Regents of the. Method for imparting pink color to cured meats. 3,821,438, Cl. 426-266.000.

Brown& Williamson Tobacco Corporation: *See*—
Harris, Richard C., Jr., 3,820,429.

Bruder, Edward A.: *See*—
Bradus, Robert; Bruder, Edward A.; and Rogers, Frederick, 3,820,485.

Bruen, Charles P.: *See*—
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Brugger, Robert Eugene: *See*—
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Brummer, Hans J.: *See*—
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Brunetti, Heimo: *See*—
Schmidt, Andreas; and Brunetti, Heimo, 3,821,334.

Brunetti, Heimo; Peterli, Hans-Jakob; Muller, Helmut; and Heller, Hansjorg, to Ciba-Geigy Corporation. 1,3-Bis-(2'-hydroxybenzoyl)-benzenes. 3,821,310, Cl. 260-591.000.

Brunner, Rudolf; and Zenker, Siegfried, to Heilmeier & Weinlein Fabrik fur Oel-Hydraulik A KG (Kommandit-Gesellschaft). Slide valve for hydraulic pressure systems. 3,820,568, Cl. 137-625.680.

Brunning, Elmer Eugene; Grover, Donald P.; Schild, Manfred; and Nickelson, Robert William, to Sunbeam Corporation. Stair holding device for vacuum cleaner. 3,820,808, Cl. 280-80.00r.

Brusilovsky, Iosif Veniaminovich: *See*—
Agushev, Vladimir Alexandrovich; Brusilovsky, Iosif Veniaminovich; Gamajunov, Alexandr Mikhailovich; Lanchikov, Konstantin Vasilievich; Sosner, Jury Moiseevich; Tsodikov, Veniamin Yakovlevich; and Judochkin, Sergei Sergeevich, 3,820,916.

Bryson, Charles J.: *See*—
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Buchmann, Paul; and Beringer, Monique, to Tamag Basel AG. Method of making a tobacco substitute material. 3,820,548, Cl. 131-2.000.

Buckell, Raymond Albert. Cooking ovens. 3,820,524, Cl. 126-20.000.

Buckwalter, Geoffrey R., to Borden, Inc., mesne. Reduction of aromatic nitro compounds to aromatic azoxy compounds using a pure acicular crystalline benzoquinone as a reduction promoter. 3,821,190, Cl. 260-143.000.

Budds, Warren F.: *See*—
Hasselbacher, Roland E.; and Budds, Warren F., 3,820,829.

Budkevich, Nikolai Pavlovich: *See*—
Nikiforov, Vladimir Pavlovich; Nosikov, Vasily Ivanovich; Kil, Ilya Genrikhovich; Tsybukov, Igor Kirillovich; Smorodinov, Alexandr Nikolaevich; Tsyplakov, Anatoly Mikhailovich; Budkevich, Nikolai Pavlovich; and Vykhodov, Nikolai Ivanovich, 3,821,101.

Buettner, Otto A. Rotary engine. 3,820,513, Cl. 123-8.170.

Bullock, Edward K., to Polaroid Corporation. Printing system employing an ink web. 3,820,457, Cl. 101-244.000.

Bunclark, Edward J.; Harrison, Warrington C.; and Forster, Eric O., to Esso Research and Engineering Company. Process for controlled curing of foams. 3,821,337, Cl. 264-26.000.

Buning, Robert, to Dynamit Nobel Aktiengesellschaft. Cross-linked shaped objects of vinyl chloride polymers. 3,821,174, Cl. 260-80.710.

Bunker-Ramo Corporation, The: *See*—
Kang, George S., 3,821,527.

Bunn, George Edward: *See*—
Grindley, William; Bunn, George Edward; Ormerod, Alan; and Harrison, Alwin, 3,820,324.

Buozynski, Leonard M., to Owens-Illinois, Inc. Power supply for gas discharge display panel systems. 3,821,606, Cl. 317-16.000.

Burch, Charles F., to United States of America, National Aeronautics and Space Administration. Grinding arrangement for ball nose milling cutters. 3,820,286, Cl. 51-97.00r.

Burckhardt, Carl, to Crystalon S.A. Link construction for a crystal pendant. 3,820,201, Cl. 24-87.00r.

Burdick, Robert E., to Rolair Systems, Inc. Conveyor system with air in floor. 3,820,467, Cl. 104-23.0fs.

Burgess, Norman E.; and Flynn, Robert E., to Domtar Limited. Breakaway handle. 3,820,710, Cl. 229-52.00b.

Burke, Mary. Adjustable hinge structure for eyeglasses. 3,820,880, Cl. 351-121.000.

Burland, Oliver J. Flashing signal light. 3,821,541, Cl. 240-22.000.

Burlington Industries, Inc.: *See*—
Hiatt, Sammy G., 3,820,950.

Burnell, Dennis G. A.; and Jahrstorfer, George W., to Chandler Evans Inc. Computer to manual changeover system. 3,820,323, Cl. 60-39.28r.

Burnett, Lauren W.: *See*—
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Burnham, Walter J.: *See*—
Liberman, Irving; Zollweg, Robert J.; and Burnham, Walter J., 3,821,587.

Burns, Stephen J. X-ray source. 3,821,579, Cl. 313-55.000.

Burrage, Robert Graham, to Lucas, Joseph, (Industries) Limited. Acceleration control for gas turbine engine. 3,820,321, Cl. 60-39.28r.

Burroughs, Corporation: *See*—
Holz, George E., 3,821,598.
Lasoff, Murray; Baldwin, Raymond C.; and Natanblut, Herman B., 3,821,735.
Ogle, James A., 3,821,586.
Przybylek, George J., 3,821,588.
Scovronek, Jacob, 3,821,584.

Burson, Bob O., to Phelon, R. E., Company, Inc. Generator and triggering device for electronic ignition system. 3,821,570, Cl. 310-70.00a.

Burt, George A., Jr.: *See*—
Neill, William M.; and Burt, George A., Jr., 3,820,484.

Busby, Joseph B.; and Dotson, Robert K., to Celanese Corporation. Electrostatic pinning of polymeric film. 3,820,929, Cl. 425-174.80e.

Busch, Albert E., to Sarkes Taizian, Inc. Digital special effects generator. 3,821,468, Cl. 178-6.800.

Buse, Frederic W.; and Sensinger, Warner E., Jr. Multiplunger reciprocating pump. 3,820,922, Cl. 417-539.000.

Buzalski, Bruce T.; Chauvin, Bernard; and Lay, Henry G., to Westinghouse Electric Corporation. Ignitor assembly for a percussive type photoflash lamp. 3,820,940, Cl. 431-93.000.

Byzov, Yury Mikhailovich: *See*—
Andreev, Oleg Semenovich; Birjukov, Boris Konstantinovich; Byzov, Yury Mikhailovich; Lekhtman, Moisei Abramovich; Perelberg, Azik Iosifovich; Strimbling, Semen Itskhovich; Trachevsky, Boris Sergeevich; Fikhman, Isak Berovich; Cherepakha, Pavel Andreevich; nd Shraifeld, Tamara Yakovlevna, 3,821,749.

Caddy Corporation: *See*—
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Calamas, Deleon Everette: *See*—
Rowe, Joseph L.; Meeker, Leeman S.; and Calamas, Deleon Everette, 3,820,272.

Callahan, George C., to Carrier Corporation. Modular multizone zone logic control center. 3,820,589, Cl. 165-2.000.

Calvert, George: *See*—
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Camp, Thomas L.: *See*—
Bigler, E. Ray; Camp, Thomas L.; and Nelson, Perry L., 3,820,281.

Campbell, David W., to American District Telegraph Company. Noninterfering electrical signaling. 3,821,479, Cl. 179-15.0bf.

Campbell, George T. R.: *See*—
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Campbell, Kenneth J., to United States of America, Navy. Automatic noise figure indicator. 3,821,648, Cl. 325-363.000.

Campbell, Robert W.; and Marrs, Oren L., to Phillips Petroleum Company. Laminating process and article produced thereby. 3,821,072, Cl. 161-214.000.

Camras, Marvin, to IIT Research Institute. Video transducing apparatus. 3,821,786, Cl. 358-4.000.

Candor, James T. Method for playing strategy golf. 3,820,786, Cl. 6-28-74.

Canevari, Roger: *See*—
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Cannon, Maxwell R., to International Business Machines Corporation. Resynchronizable recording system. 3,821,798, Cl. 360-51.000.

Canon Kabushiki Kaisha: *See*—
Nitanda, Hiroshi; Hattori, Hiroyuki; and Miyamoto, Koichi, 3,820,889.
Sone, Yoshiaki; and Sawada, Takamasa, 3,820,884.

Canup, Robert E., to Texaco Inc. High frequency type ignition system. 3,820,520, Cl. 123-148.00e.

Caputo, William R.; and Mullis, Clyde M., to Westinghouse Electric Corporation. Method of constructing electrical apparatus. 3,820,238, Cl. 29-606.000.

Caputo, William R., to Westinghouse Electric Corporation. Elevator system. 3,821,628, Cl. 321-9.00r.

Carborundum Company, The: *See*—
Lin, Ruey Y.; Murty, Hari N.; and Pietrantuone, Anthony J., 3,821,074.

Carey, Peter Majendie; and Lai-Hing, Courtney, to Lektromedia Ltd. Method and apparatus for displaying information on the screen of a monitor. 3,821,730, Cl. 340-324.0ad.

Carey, Wayne C., 1/3 each to Carey, Wendel W. and Freeland, Kay. Spray-type p.n release and method of making the same. 3,821,007, Cl. 106-150.000.
Carey, Wendel W.: *See—*
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Carl Manufacturing Company Ltd.: *See—*
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Carlson, Robert D.; Kraina, Jack H.; and Wegner, Robert C., to Caterpillar Tractor Co. Acoustical louver for earthmoving vehicles. 3,820,629, Cl. 181-33.00g.
Carmody, Raymond Francis, to Shakespeare Company. Tubular laminate and a method of making a tubular laminate. 3,820,573, Cl. 138-141.000.
Carnot, Robert L.: *See—*
Lang, Robert S.; and Carnot, Robert L., 3,820,552.
Caron, Claude; and Hurtado, Jean, to Soletanche, Societe Anonyme. Watertight wall of any desired length, without joints, constructed by cutting trenches in the ground, and method for its construction. 3,820,344, Cl. 61-35.000.
Caron, Roger P.; and Howard, Thomas P., to Water Control Products, Inc., mesne. Hydraulic flush tank with improved seating and reseal-ing means. 3,820,754, Cl. 251-38.000.
Carr, Harry A. Magnetic keeper accessory for conventional tools. 3,821,676, Cl. 335-285.000.
Carr, Peter William: *See—*
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Carron, Georges; and Violet, Jean-Louis, to Commissariat a l'Energie Atomique. Method of fabrication of a probe for a hygrometer. 3,821,093, Cl. 204-38.00a.
Carson, Edward R., to Goodyear Aerospace Corporation. Visual stimulator employing two-color television system. 3,821,793, Cl. 358-42.000.
Carter, Walter H.: *See—*
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Casey, Richard W.: *See—*
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Cass, Richard, to TRW Inc. Rack and pinion assembly. 3,820,415, Cl. 74-498.000.
Cassidy, Harry J., to Chrysler Corporation. Rotary vane refrigerant gas compressor. 3,820,924, Cl. 418-89.000.
Cassidy, John Edward; and Millar, Philip Glenn, to Imperial Chemical Industries Limited. Complex aluminium phosphates. 3,821,357, Cl. 423-300.000.
Castillo, Adolfo; Csakvary, Oscar; and Jureit, John Calvin, to Automated Building Components, Inc. Apparatus for fabricating wooden building frames. 3,820,502, Cl. 118-6.000.
Castro, Francisco Carrasco; and Navarro, Carlos Badiola, said Castro assor. to American Cyanamid Company. Treatment of swine dysentery. 3,821,390, Cl. 424-270.000.
Caterpillar Tractor Co.: *See—*
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Anderson, Michael L.; Fowler, Harold Wayne; and McKie, David Alexander, 3,820,421.
Carlson, Robert D.; Kraina, Jack H.; and Wegner, Robert C., 3,820,629.
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Scholl, Rolland D., 3,821,625.
Ward, Harold L., 3,820,441.
Ward, Harold L., 3,820,444.
Cavalieri d'Oro, Enzo; and Salari, Luciano, to Societa Italiana Telecomunicazioni Siemens S.p.A. Tracking system with pointing error detector. 3,821,741, Cl. 343-117.00r.
Caveness, Gerald W. Basketball training aid. 3,820,783, Cl. 273-1.50a.
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Chan, David Yee Hing, to American Cyanamid Company. Acrylonitrile polymerization terminated with a short stopping agent. 3,821,177, Cl. 260-85.500.
Chan, Rosalind Po-Kuen: *See—*
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Chang, Chi Shih; and Jen, Teh-Sen, to International Business Machines Corporation. Complementary field effect transistors having P doped silicon gates. 3,821,781, Cl. 357-44.000.
Chang, Nuke Ming; Flowers, I. J.; and Anderson, Gordon M., to Santa Fe International Corporation. Blow-out sensor. 3,821,726, Cl. 340-239.00r.
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Chernyshev, Petr Sergeevich; Spiridonov, Konstantin Alexeevich; Pakhomov, Vladimir Alexandrovich; Nikolaev, Georgy Vasilievich; Volfson, Izrail Mordukhovich; Levchenko, Boris Leonidovich; Ryzhkov, Viktor Kuzmich; Gladkovsky, Petr Stanislavovich; Shargorodsy, Viktor Semenovich; and Shlyapin, Alexandr Nikolaevich; deceased (by Davidovich, Tatyana Ivanovna; administrator). Exhuast pipe of a steam turbine. 3,820,915, Cl. 415-116.000.
Chertok, Allan; and Gillette, Timothy C., to Concord Computing Corporation. Data communication system and apparatus. 3,821,705, Cl. 340-152.00r.
Chevallereau, Roger: *See—*
Abbes, Claud; Bianchi, Santos; Chevallereau, Roger; Rogemont, Jean; Roques, Robert; Rouaud, Christian; and Royer, Henri, 3,820,799.
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Vargha, Laszlo; Horvath, Tibo; Halasz, Maria; Csanyi, Endre; and Dumdovich, Boris, 3,821,270.
Chisholm, John P.; Lennon, William T., Jr.; Doane, James R.; and Maslow, Frank Z., to Sierra Research Corporation. Aircraft locating system using abile tacan/vortac/dme. 3,821,523, Cl. 235-150.270.
Chittenden, Richard Marion; Whitton, Aldean William; Macalalad, Fidel Vallaluna; Massman, Richard; and Wilson, Earl David, to Abbott Laboratories. Combined air vent, filter and adapter for urinary drainage assemblies. 3,820,546, Cl. 128-349.000.
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Chow, Alfred W.; Dunn, George L.; Hoover, John R. E.; and Weisbach, Jerry A., to Smithkline Corporation. 7-Heterocyclic substituted cephalosporins. 3,821,207, Cl. 260-243.00c.
Christensen, Carl R. Wax carving tool tip. 3,821,513, Cl. 219-233.000.
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Colosimo, Richard L. Commutatorless and brushless direct current motor or generator. 3,821,575, Cl. 310-266.000.
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Cricchi, James R., to Westinghouse Electric Corporation. Method and apparatus for electronically recovering metal-nitride-oxide semiconductor devices exposed to radiation. 3,821,566, Cl. 307-304.000.

Cricchio, Renato, to Gruppo Lepetit S.p.A. N-Derivatives of 4-amino-4-desoxy-rifamycin SV and preparation. 3,821,199, Cl. 260-239.30p.

Critchlow, Arthur J.; and Bryson, Charles J., to Materials Management Systems, Inc. Article handling machine. 3,820,667, Cl. 214-1.0bt.

Croan, Kenneth F. Honeycomb spacer strip. 3,820,177, Cl. 6-2.00a.

Croset, Michel; and Velasco, to Thomson-CSF Short wavelength waveguides formed of metal oxides. 3,820,871, Cl. 350-96.0wg.

Crosslen, Louis John, to Mayer, Frank, & Associates, Inc. Theft proof display device. 3,820,862, Cl. 312-123.000.

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Crowe, Eugene Melroy, 1/2 to Salyer, Ralph. Fuel metering control for fuel injection systems. 3,820,332, Cl. 60-595.000.

Cruze, Alonzo J., Jr., to Dixie Water Treatment Company. Self cleaning filter apparatus and system. 3,820,658, Cl. 210-104.000.

Cryplex Industries, Inc.: *See—*
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Crystalon S.A.: *See—*
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Culhane, Gerald John; Layton, Gary Richard; and Pittman, Walter Elwood, to Eastman Kodak Company. Process control apparatus and method for silver halide emulsion making. 3,821,002, Cl. 96-94.00r.

Cullen, John S.; and Huber, Paul W., to Multiform Disiccant Products, Inc. Adsorbent cartridge. 3,820,309, Cl. 55-387.000.

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Cunningham, Ernest R., to Grip-Pak, Inc. Apparatus and method of producing scrapless carrier devices from a siamese tube. 3,820,425, Cl. 83-7.000.

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Curley, John L.; Donahue, Thomas J.; Franklin, Benjamin S.; Martland, Wallace A.; and Cornaro, Louis V., to Honeywell Information Systems, Inc. Memory storage sequencer. 3,821,709, Cl. 340-172.500.

Curn, Frantisek: *See—*
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Cutforth, Howard G.; LeFebvre, Clarence A.; and Steinle, Melvin E., to United Aircraft Corporation. Composite propellant containing molybdenum to reduce electromagnetic radiation interference in combustion products. 3,821,042, Cl. 149-19.400.

Cutton, John G., to United States Steel Corporation. Method of making flat steel files. 3,820,372, Cl. 72-203.000.

Cybersol, Inc.: *See—*
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Cywinski, Norbert F., to Phillips Petroleum Company. Vinylation of organic compounds. 3,821,298, Cl. 260-561.00r.

Dahl, Alfred G. Tape cleaning and lubricating apparatus. 3,820,504, Cl. 118-65.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
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Daimler-Benz Aktiengesellschaft: *See—*
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Andres, Rudolf; Moller, Hermann; and Seyfried, Franz, 3,820,382.
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D'Aiuto, John Ralph: *See—*
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Daley, Lawrence R.; and Ferment, George R., to Celanese Corporation. Surface modification of graphite fibers. 3,821,013, Cl. 117-46.0cc.

Dall'Asta, Gino; Meneghini, Pietro; and Gennaro, Ugo, to Montecatini Edison S.p.A. Soluble polymers having essentially the structure of polyalkenamer chloro-nitroesters and methods of preparing same. 3,821,183, Cl. 260-93.100.

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D'Angelo, Antonio Joseph, to Pennwalt Corporation. Novel dialkyl peroxydicarbonates. 3,821,273, Cl. 260-463.000.

Daniels, Wiley Edgar; and Duncan, John Julian, to GAF Corporation. Stable aqueous emulsions of vinyl ether/acrylate/N-alkylol acrylamide terpolymers and treatment of textiles therewith. 3,821,175, Cl. 260-80.730.

Danree, Bernard: *See—*
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Danzik, Michell: *See—*
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Darling, Alan Sydney, to Johnson, Matthey & Co., Limited. Sheathed thermocouple. 3,821,030, Cl. 136-232.000.

Dart Industries Inc.: *See—*
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Van Deventer, Arthur J.; and Poland, David R., 3,820,383.

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Datatrol, Inc.: *See—*
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Daugherty, Hiram G.; and Little, Harvey G., to Ciba-Geigy Corporation. Reducing hydrogen cyanide levels in the formation of cyanoalkylamino substituted triazines. 3,821,220, Cl. 260-249.600.

Daugherty, Ralph K.; and Halvorsen, Gary A., 1/2 to Hanscom, Genevieve I. and 1/2 to Hanscom, Genevieve I., Magnuson, Robert, Thomson, Lois J.; trustees of the estate of Magnuson, Roy M., deceased. Rotary solenoid having a large angle of rotation. 3,821,67, Cl. 335-267.000.

Davidovich, Tatyana Ivanovna: *See—*
Chernyshev, Petr Sergeevich; Spiridonov, Konstantin Alexeevich; Pakhomov, Vladimir Alexandrovich; Nikolaev, Georgy Vasilievich; Volfson, Izrail Mordukhovich; Levchenko, Boris Leonidovich; Ryzhkov, Viktor Kuzmich; Gladkovsky, Petr Stanislavovich; Shargorodsy, Viktor Semenovich; and Shlyapin, Alexandr Nikolaevich, 3,820,915.

Davis, Alvin Q., Jr. Flow proportional pneumatic composite sampler. 3,820,555, Cl. 137-100.000.

Davis, Bobby, A., to Dymo Industries, Inc. Embossing tool. 3,820,645, Cl. 197-6.700.

Davis, James L.; Lopke, Edward L.; and Pechous, Leslie J., to General Motors Corporation. Thermocouple amplifier. 3,821,562, Cl. 307-117.000.

Davis, John C.: *See—*
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Davis, Larry G.: *See—*
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Davis, Lon R. Rigid boot construction with self-cleaning sole. 3,820,255, Cl. 36-2.5al.

Davis, Lon R. Ski-adapter combination, for free-style maneuvering. 3,820,802, Cl. 280-11.13t.

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Whetstone, Albert L.; Fine, Samuel; and Davis, Robert, 3,821,491.

Dayco Corporation: *See*—
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Sparks, James I.; and Spivy, Paul L., 3,820,583.

De Angelo, Michael Anthony, to Western Electric Company Incorporated. Method of forming an adherent metallic pattern on a polyimide surface. 3,821,016, Cl. 117-47.00a.

De Gouville, Jean-Bernard, to Etablissements Sourdillon, Matricage et Robinetterie de Precision. Thermostatic control of vessels subjected to heating. 3,820,399, Cl. 73-368.000.

De Kort, Gijsbertus Maria Arnolds Josephus: *See*—
Westendorp, Frans Frederik; Luiten, Willem; and De Kort, Gijsbertus Maria Arnolds Josephus, 3,821,034.

de la Cierva, Juan J. Electrostatic discharging system. 3,821,603, Cl. 317-2.00d.

De Lancey, Warren H.; and Cooperridge, Myron T., to Beckett, R. W., Corporation. Power burner. 3,820,943, Cl. 431-265.000.

De Langis, Philip A. Socket ground line testing apparatus. 3,821,639, Cl. 324-51.000.

De Lesseux, de Bazelaire Jacques: *See*—
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De Marco, Joseph V.: *See*—
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De Pauw, Richard A.; and Stamp, Tom G., to International Harvester Company. Axle adjusting mechanism for agricultural machines. 3,820,618, Cl. 180-70.00r.

De Wit, Cornelis Leendert: *See*—
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Deanin, Rudolph D.: *See*—
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Decco Limited: *See*—
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Dechelette, Helen, to AMP Incorporated. Electrical connector and contact therefor. 3,821,693, Cl. 339-217.00s.

Dedrick, Robert L.: *See*—
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Deere & Company: *See*—
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Miller, Wayne Russel; and Termont, Charles George, 3,820,620.
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Sawyer, Bobby Gene; and Francis, Robert Charles, 3,820,311.
Shipinski, John Henry, 3,820,723.
Trott, Clarence Robert, 3,820,609.

Deike, Robert F. Container anchor rack. 3,820,750, Cl. 248-154.000.

Delalande S.A.: *See*—
Fauran, Claude P.; Douzon, Colette; Raynaud, Guy M.; and Sergant, Micheline Y., 3,821,215.

Delf, Gerhard; and Schommarz, Gunther, to Volkswagenwerk Aktiengesellschaft. Circuit arrangement for fuel heating device. 3,820,938, Cl. 431-78.000.

Dellian, Kurt A.; Weiskopf, Marvin; and Lee, Samuel, to Ciba-Geigy Corporation. Use of solid carrier for dyeing hydrophobic fibers. 3,820,952, Cl. 8-173.000.

Delmar Chemicals Limited: *See*—
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Delphia, John B. Sedative bullet. 3,820,465, Cl. 102-92.000.

Deltrol Corp.: *See*—
Webb, George L., 3,821,612.

Demaray, Merlin E., to Ranco Incorporated. Mulitple zone air conditioning system. 3,820,713, Cl. 236-1.00e.

Demi, Roy C., to Robertshaw Controls Company. Fuel supply manifold having orienting means for mounting a control device thereto. 3,820,563, Cl. 137-561.000.

Demmel, Edward J.: *See*—
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Den-Tal-Ez Mfg. Co.: *See*—
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Denton, Harvey R. Lighter-than-air aircraft. 3,820,744, Cl. 244-5.000.

Dentsply International Inc.: *See*—
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Deritend Engineering Company Limited, The: *See*—
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DeRooij, Abraham H., to Stamicarbon N.V. Separation of lactams from a medium coating concentrated sulphuric trioxide in combination with the preparation of phosphate fertilizers. 3,820,972, Cl. 71-37.000.

Desnoyers, Pierre: *See*—
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Devault, Birch L.: *See*—
Grunert, Kurt A.; and Devault, Birch L., 3,821,671.

Devella, Nicholas J. Covering arrangement for openings and optical lenses. 3,820,682, Cl. 220-55.00k.

Devore, Ernest W.; Hall, Phil H.; and Irwin, John W., to International Business Machines Corporation. Signal transferring. 3,821,703, Cl. 340-146.1al.

DeWinter, John Christian; Leheny, Robert Francis; Nahory, Robert Edward; Shah, Jagdeep Chandravadan; and Shaklee, Kerry Lee, to Bell Telephone Laboratories, Incorporated. Semiconductor laser employing III-VI compounds. 3,821,662, Cl. 331-94.50h.

Dewsnap, Paul, to Donaldson Display Company, Inc. Display device. 3,820,262, Cl. 40-10.00d.

Dexter, Martin, to Ciba-Geigy Corporation. Benzophenone-3,4,3,4-tetracarboxylic acid diimides of 3,5-dialkyl-4-hydroxyphenylsubstituted amines. 3,821,162, Cl. 260-45.80n.

Di Edwardo, Andrew H.; and Gump, Klaus H., to Celanese Corporation. Process for the thermal stabilization of polyacrylonitrile fibers and films. 3,820,951, Cl. 8-115.500.

Diamond, Julius; and Santora, Norman Julian, to Rorer, William H., Inc. α-Acylthio-p-cyclohexylphen-ylacetic acids and derivatives. 3,821,267, Cl. 260-455.00r.

Diamond, Julius; and Santora, Norman Julian, to Rorer, William H., Inc. α-Acylthio biphenylylacetic acids. 3,821,268, Cl. 260-455.00r.

Diamond, Julius, to Rorer, William H., Inc. Tetrahydronaphthylalkanoic acids and their derivatives. 3,821,289, Cl. 260-501.160.

Diamond, Julius; and Novick, William J., Jr., to Rorer, William H., Inc. Therapeutic compositions containing 1-substituted biguanides and method of treating gastrointestinal disorders therewith. 3,821,406, Cl. 424-326.000.

Diamond Shamrock Corporation: *See*—
Temple, Ralph E., 3,821,119.

Dickey, W. S., Clay Manufacturing Company: *See*—
Ligon, Elmer R.; and Friley, Paul B., 3,820,826.

Dickinson, Thorn W.; and Gronski, Chester, to Textron, Inc. Segmented retaining rings for antifriction ball bearings. 3,820,867, Cl. 308-201.000.

Dickson, Robert E., to Colgate-Palmolive Company. Composition for imparting non-permanent soil-release characteristics comprising an aqueous solution of polycarboxylate copolymer and water-soluble amine. 3,821,147, Cl. 260-29.60n.

DIEHL: *See*—
Mehner, Walter; and Tietz, Werner, 3,821,534.

Diehl Datensysteme GmbH: *See*—
Sturm, Konrad, 3,821,672.

DIEHL, Firma: *See*—
Klein, Friedrich; and Kageler, Peter, 3,821,723.

Dietrich, Isolde: *See*—
Zerbst, Helmut; Weyl, Reinhard; and Dietrich, Isolde, 3,821,554.

Dietze, Wolfgang, to Siemens Aktiengesellschaft. Method and device for the production of tubular members of silicon. 3,820,935, Cl. 425-447.000.

Dietzel, Karl; Peilstocker, Gunter; Meyer, Karl-Heinrich; and Streib, Hugo, to Bayer Aktiengesellschaft. Safety panes. 3,821,071, Cl. 161-183.000.

Dimroth, Peter: *See*—
Ruider, Guenther; and Dimroth, Peter, 3,821,191.

Dittrich, Werner; and Lenz, Arnold, to Dynamit Nobel Aktiengesellschaft. Binders for finishing and coating compositions. 3,821,003, Cl. 106-1.000.

Dix, James S.; Mathis, Ronald D.; and Underwood, John H., to Phillips Petroleum Company. Dyeable polyolefins. 3,821,142, Cl. 260-23.00h.

Dixie Water Treatment Company: *See*—
Cruze, Alonzo J., Jr., 3,820,658.

Dixon, Harold, to Beecham Group Limited. Detergent and shampoo compositions. 3,821,124, Cl. 252-531.000.

Dixon, Lewis C., to United States of America, Navy. Variable sized fragment explosive projectile. 3,820,464, Cl. 102-67.000.

Dixon Malt Company Limited, The: *See*—
Pollock, James Richard Allan, 3,821,419.

Do Nascimento, Jose'Maria: *See*—
Podesva, Ctirad; and Do Nascimento, Jose'Maria, 3,821,221.

Doane, James R.: *See*—
Chisholm, John P.; Lennon, William T., Jr.; Doane, James R.; and Maslow, Frank Z., 3,821,523.

Dolfi, James J., Sr. Automatic manifold vacuum spoiler. 3,820,518, Cl. 123-119.00b.

D'Olier, George, to Raybestos-Manhattan, Inc. Insulating material. 3,821,063, Cl. 161-60.000.

Domenico, Penelope B., to Dow Chemical Company, The. Polyhalo-4-pyridine sulfen and sulfonamides. 3,821,216, Cl. 260-247.100.

Domtar Limited: *See*—
Burgess, Norman E.; and Flynn, Robert E., 3,820,710.

Donahue, Thomas J.: *See*—
Curley, John L.; Donahue, Thomas J.; Franklin, Benjamin S.; Martland, Wallace A.; and Cornaro, Louis V., 3,821,709.

Donaldson Display Company, Inc.: *See*—
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Donohue, James M.; Kramer, Joseph R.; and Rouek, Victor, to Xerox Corporation. Synchronizing apparatus. 3,820,893, Cl. 355-14.000.

Dooley, James A.: *See*—
Staples, Paul R.; and Dooley, James A., 3,821,681.

Doran, Robert J.; Grall, Robert W.; and Pane, Joseph F., to Windor, Incorporated. Carton casing apparatus. 3,820,302, Cl. 53-159.000.

Doran, Thomas J., Jr.; and Stevens, Henry C., to PPG Industries, Inc. Abrasion-resistant vulcanizates. 3,821,133, Cl. 260-3.000.

Dorman, Linneaus C., to Dow Chemical Company, The. Nα-[6-Substituted carbobenzyloxyamino)-hexanoyl]-Nε-(carbobenzyloxy)-L-lysine compounds. 3,821,189, Cl. 260-112.500.

Dorn, Chester, to Superior Manufacturing Company. Pump base assembly. 3,820,800, Cl. 277-237.000.

Doss, Richard, to Phillips Petroleum Company. Polymercaptan epoxy resin hardener. 3,821,166, Cl. 260-47.0en.

Dotson, Robert K.: *See*—
Busby, Joseph B.; and Dotson, Robert K., 3,820,929.

Dougherty, John W.: *See*—
Halladay, Paul D.; and Dougherty, John W., 3,821,443.

Douzon, Colette: *See*—
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Dow Chemical Company, The: *See*—
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Barron, Benny Gene; and Dunlap, James Ray, 3,821,130.
Braeuninger, Karl F., 3,820,374.
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Noveroske, Robert L., 3,820,973.
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Tong, Yulan C., 3,821,213.

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Timmler, Helmut; Draber, Wilfried; Buchel, Karl Heinz; and Plempel, Manfred, 3,821,394.

Drelich, Arthur H.; and Bowman, Bobby R., to Johnson & Johnson. Stable colloidal synthetic resin binder compositions. 3,821,146, Cl. 260-29.6mm.

Drenzyk, Tefel F. Finger saver pliers. 3,820,274, Cl. 43-53.500.

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Driver, Wilbur B., Company: *See*—
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Dron, Ninel Alexeevna: *See*—
Alexandrovich, Eduard-Gely Vitalievich; Belkin, Nikolai Vasilievich; Zelensky, Konstantin Fedorovich; Kanunov, Mikhail Alexeevich; Razin, Anatoly Alexandrovich; Tarasova, Ljudmila Viktorovna; Toropov, Anatoly Pavlovich; Troshkin, Ivan Andreevich; Khudyakov, Ljubov Nikolaevna; Tsukerman, Veniamin Aronovich; Dron, Ninel Alexeevna; Sloeva, Galina Nikolaevna; Ioffe, Jury Konstantinovich; and Vasiliev, Vasily Vasilievich, 3,821,580.

Dryer, Eldon O., to Shamban, W. S., & Co. Captive plastic static seal in ring joint groove. 3,820,830, Cl. 285-336.000.

DSO Agromachina: *See*—
Mladenov, Venko Dimitrov; and Maslinkov, Ivan Vasilev, 3,820,547.

Du Pont de Nemours, E. I., and Company: *See*—
Bacher, Rudolph John, 3,821,611.
Beaton, Daniel Harper, 3,821,171.
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Duddey, James E., to Goodyear Tire & Rubber Company, The. Cationically dyeable polyesters with hydroxyalkylated isethionic acid. 3,821,169, Cl. 260-77.000.

Dudkin, Vyacheslav Fedorovich: *See*—
Bogrets, German Nikolaevich; Semenov, Oleg Alexeevich; Dudkin, Vyacheslav Fedorovich; and Vorontsov, Anatoly Konstantinovich, 3,820,969.

Dudley, Juliette T. Color coded pocketed target projectiles and scoring indicia. 3,820,789, Cl. 273-95.00r.

Duerr, Dieter; Aebi, Hans; and Ebner, Ludwig, to Ciba-Geigy AG. Methods of controlling gastropods. 3,821,400, Cl. 424-304.000.

Duetsche Gold-und Silber-Scheideanstalt vormals Roessler: *See*—
Klingler, Karl Heinz, 3,821,301.

Duff, Thomas Guy, to Bell Telephone Laboratories, Incorporated. Signal loop testing apparatus. 3,821,495, Cl. 179-175.000.

Duffy, Edward J. Beading tool. 3,820,370, Cl. 72-75.000.

Dugan, James G.; Hancock, Albert S., Jr.; Hausske, Gene W.; Huston, Kenneth G.; Rosenberg, Bernard L.; and Smith, Shirley M., to Robbins Incubator Co. Apparatus for incubating and hatching eggs. 3,820,507, Cl. 119-35.000.

Dumdovich, Boris: *See*—
Vargha, Laszlo; Hor ath, Tibo; Halasz, Maria; Csanyi, Endre; and Dumdovich, Boris, 3,821,270.

Dumitrescu, Constantin: *See*—
Constantinescu, Petre B.; Barthon, Stefan; Dumitrescu, Constantin; and Alexandrescu, Mihail, 3,820,448.

Dumoulin, Jean; and Linguenheld, Louis, to Rhone-Poulenc S.A. Organosilicon compositions for the non-stick treatment of sheets and films. 3,821,154, Cl. 260-33.6sb.

Duncan, John Julian: *See*—
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Dundon, Thomas M.; and Hatton, Terence J., to Datatrol, Inc. Multiplexer system. 3,821,480, Cl. 179-15.00a.

Dunlap, James Ray: *See*—
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Dunn, George L.: *See*—
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Durbin, Arland J. Automatic safety cutoff valve. 3,820,565, Cl. 137-614.200.

Durbin, Jesse, Jr.; and D'Aiuto, John Ralph, to Magnavox Company, The. Chroma tracking circuit. 3,821,789, Cl. 358-27.000.

Durkoppwerke G.m.b.H.: *See*—
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Dvornik, Dusan M.: *See*—
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Dworschack, Robert G.: *See*—
Lamm, William R.; Davis, Larry G.; and Dworschack, Robert G., 3,821,082.

Dyer, Rex H.; and Burnett, Lauren W., to Dyer Weld Tool Corporation. Tip dressing tool. 3,820,437, Cl. 90-12.000.

Dyer Weld Tool Corporation: *See*—
Dyer, Rex H.; and Burnett, Lauren W., 3,820,437.

Dymo Industries, Inc.: *See*—
Davis, Bobby, A., 3,820,645.

Dynamit Nobel AG: *See*—
Hulsmann, Hans Leo; and Renckhoff, Gustav, 3,821,292.

Dynamit Nobel Aktiengesellschaft: *See*—
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Dittrich, Werner; and Lenz, Arnold, 3,821,003.

E. R. C. Laboratory, Inc.: *See*—
Maltese, John, 3,821,800.

East, Gregory M. Buoyancy regulating apparatus. 3,820,348, Cl. 61-70.000.

Eastman Kodak Company: *See*—
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Collins, Wayne I., 3,820,738.
Culhane, Gerald John; Layton, Gary Richard; and Pittman, Walter Elwood, 3,821,002.
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Fumia, Arthur, Jr.; and Heseltine, Donald W., 3,821,205.
Lincoln, Lewis L.; and Heseltine, Donald W., 3,821,233.
Rule, Norman Geoffrey; and Riordan, Richard C., 3,820,989.
Tan, Yen T.; Khosla, Rajinder P.; Fischer, John R.; and Ranadive, Deepak K., 3,820,988.
Weber, Joanne B., 3,821,001.

Easton, Harry Thomas: *See*—
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Eaton, Homer L.; and Shevell, Walter I., to Conrac Corporation. Method and apparatus for automatically compensated tube bending. 3,821,525, Cl. 235-151.100.

Ebara Manufacturing Co., Ltd.: *See*—
Machida, Shunichi; Tsujita, Masaharu; Nakaya, Shintaro; and Ueno, Ryoji, 3,820,581.

Eberhardt, Roland C.; and Whisenant, Joseph W. Dental irrigator. 3,820,532, Cl. 128-66.000.

Ebey, Edward W., to International Harvester Company. Brake mounting. 3,820,638, Cl. 188-206.00a.

Ebner, Ludwig: *See*—
Duerr, Dieter; Aebi, Hans; and Ebner, Ludwig, 3,821,400.

Economopoulos, Mario; and Wilmotte, Stephan Hubert. Process for the predetermination of the datum values of a wide-strip-finishing rolling mill train controlled by an electronic calculator. 3,820,711, Cl. 235-151.100.

Ecos Electronics Corporation: *See*—
Portoulas, Peter G., 3,821,641.

Edge, Gordon Malcolm: *See*—
Plows, Graham Stuart; and Edge, Gordon Malcolm, 3,821,488.

EDN Corporation: *See*—
Miller, Alan R., 3,821,058.

Edwards, Bryant, to Illinois Tool Works Inc. Injection mold for producing open-mouthed thin-walled containers having means to prevent radial deflection of the male mold part. 3,820,931, Cl. 425-242.00r.

Edwin, Allan I.: *See*—
Bennett, Melvin T.; Vlach, Thomas L.; Edwin, Allan I.; and Venturi, Gino, 3,821,706.

Effer, Dennis, to Northern Electric Company Limited. Process for packaging light emitting devices. 3,820,237, Cl. 29-588.000.

Egami, Katsusuke: *See—*
Endo, Tetsuhiko; Aoba, Toshio; Morishita, Shozo; Egami, Katsusuke; and Hagihara, Shingo, 3,820,730.

Egan, Richard R.: *See—*
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Egnaczak, Raymond Keith, to Xerox Corporation. Method of cleaning accumulated material from a slot. 3,821,027, Cl. 134-21.000.

Ehrenreich, A. & Cie: *See—*
Maxeiner, Gottfried; and Muhr, Heinrich, 3,820,908.

Ehrlich, Stanley L., to Raytheon Company. Super-directive system. 3,821,740, Cl. 343-100.0sa.

Eichers, Ursula: *See—*
Ruter, Jorn; Magosch, Karl-Heinz; Rombusch, Konrad; and Eichers, Ursula, 3,821,184.

Elam, Robert Runyon; Heller, Ralph Marc; and Muehldorf, Eugen Igor, to International Business Machines Corporation. Self adaptive compression and expansion apparatus for changing the length of digital information. 3,821,711, Cl. 340-172.500.

Electro-Module, Inc.: *See—*
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Elerdashvili, Georgy Vasilievich: *See—*
Korshak, Vasily Vladimirovich; Andrianov, Kuzma Andrianovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Khananashvili, Lotary Mikhailovich; Vasilieva, Tatyana Vsevolodovna; Elerdashvili, Georgy Vasilievich; Gureeva, Galina Ilinichna; Kotov,Valery Mikhailovich; and Brontman, Rostislav Lazarevich, 3,821,112.

Eley, Edgar R., to Westinghouse Electric Corporation. Transformer having a cast winding structure with integral insulating barriers. 3,821,678, Cl. 336-96.000.

Eliott, William W.: *See—*
Pizzo, James J.; and Eliott, William W., 3,820,670.

Emanuel, Nikolai Markovich: *See—*
Bljumberg, Erna Albertovna; Ivanjukov, Demid Vasilievich; Maslov, Sergei Alexeevich; Norikov, Jury Dmitrievich; Emanuel, Nikolai Markovich; and Boiko, Vladimir Vasilievich, 3,821,259.

Emanuelsson, Ernst Ingemar: *See—*
Stenberg, Erik Gunnar; and Emanuelsson, Ernst Ingemar, 3,821,076.

Emerson Electric Co.: *See—*
Lindberg, Allan W., 3,821,620.

Enders, Edgar; Stendel, Wilhelm; Meier, Jurgen-Dietrich; and Francque, Marc, to Farbenfabriken Bayer Aktiengesellschaft. 2-Aryliminopyrrolidines and their production. 3,821,204, Cl. 260-240.00f.

Endo, Tetsuhiko; Aoba, Toshio; Morishita, Shozo; Egami, Katsusuke; and Hagihara, Shingo. Automatic doffing apparatus for textile machine having one or more winding units. 3,820,730, Cl. 242-35.50r.

Engle, Charles J.: *See—*
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English Electric Company Limited, The: *See—*
Wood, Allan John, 3,821,505.

English, Eugene E.: *See—*
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Enjymic Malt Company Limited, The: *See—*
Pollock, James Richard Allan, 3,821,419.

Enthone, Incorporated: *See—*
Kampe, Marcis M., 3,821,094.

Enviro-Labs, Inc.: *See—*
Ladine, Duane A., 3,821,520.

Environmental Design, Inc.: *See—*
Kern, Hall S.; and Barnes, Murphy L., Jr., 3,820,170.

Enzie, William Howard; Vanasse, Norman Alfred; Tracy, Gerald Thomas; and Easton, Harry Thomas, to General Foods Corporation. Coffee package. 3,821,427, Cl. 426-131.000.

Erickson, Ernest S.; deceased (by Erickson, Jane R.; administratrix), to Sperry Rand Corporation. Electric heater device. 3,821,517, Cl. 219-546.000.

Erickson, Fred W.; and Price, John G., to Litton Systems, Inc. Digital display generators. 3,821,727, Cl. 340-324.00a.

Erickson, Jane R.: *See—*
Erickson, Ernest S., 3,821,517.

Erickson, Lennart G.; and Erickson, William S. Water jet projector and control apparatus. 3,820,714, Cl. 239-10.000.

Erickson, Robert E.: *See—*
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Erickson, William S.: *See—*
Erickson, Lennart G.; and Erickson, William S., 3,820,714.

Ericson, John A. Botton pour apparatus for metal ladle. 3,820,693, Cl. 222-559.000.

Erikson, Leslie E., to Norton Company. Method for the rapid cure of condensation polymers and products resulting therefrom. 3,820,290, Cl. 51-298.000.

Eriksson, Erik Sture; and Ingemarsson, Gosta Ingemar, to Aktiebolaget Karlstads Mekaniska Werkstad. Method for forming and washing a fibrous web. 3,820,452, Cl. 100-37.000.

Eriksson, Erik Sture, to Aktiebolaget Karlstads Mekaniska Werkstad. Multi-layer paper formation wherein outer layers are substantially free of BOD substances. 3,821,073, Cl. 162-126.000.

Ernstoff, Michael N.; Hoffman, William C.; Fehr, Eric R.; and Winner, Richard N., to Hughes Aircraft Company. Television display system. 3,821,796, Cl. 358-65.000.

Erwin, Robert Dale, to Mallory, P. R., & Co., Inc. Means correcting a wrong-way directional rotation of a rotating member. 3,821,567, Cl. 310-41.000.

Esso Research and Engineering Company: *See—*
Bunclark, Edward J.; Harrison, Warrington C.; and Forster, Eric O., 3,821,337.
Hu, Shih-En, 3,821,302.
Makowski, Henry S.; and Lundberg, Robert D., 3,821,148.
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Estes Industries Inc., mesne: *See—*
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Estey, Bernard A.; Estey, Charles S.; and Estey, Owen S. Process for producing dried potato-containing animal food supplement. 3,821,446, Cl. 426-373.000.

Estey, Charles S.: *See—*
Estey, Bernard A.; Estey, Charles S.; and Estey, Owen S., 3,821,446.

Estey, Owen S.: *See—*
Estey, Bernard A.; Estey, Charles S.; and Estey, Owen S., 3,821,446.

Etablissement Rafel, mesne: *See—*
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Ettel, Victor Alexander, to International Nickel Company, Inc., The. Current density redistributing anode. 3,821,097, Cl. 204-106.000.

Ettenberg, Michael, to RCA Corporation. Method of epitaxially depositing a semiconductor material on a substrate. 3,821,039, Cl. 148-171.000.

Evans Products Company: *See—*
Beeson, Harry E., 3,820,475.

Evans, Trevor G.: *See—*
Milik, Rudolf F. L., 3,820,760.

Evans, Wallace D., Jr., to Rolatape Corporation. Measuring wheel structure. 3,820,246, Cl. 33-141.00r.

Evans, Wendell Irving, to Cincinnati Milacron Inc. Quick-change wheel guard for tool and cutter grinder. 3,820,288, Cl. 51-269.000.

Everflex Products, Inc.: *See—*
Morin, Louis F., 3,820,825.

ExCel Engineering, Incorporated: *See—*
Flinchbaugh, Donald E., 3,820,549.

Excelermatic, Inc.: *See—*
Kraus, Charles E., 3,820,416.

Expo Nord AB: *See—*
Sigfrid, Eric, 3,820,845.

Ezekiel, Aaron David, to Ilford Limited. Process for the production of α-amino-acid hydrohalides. 3,821,295, Cl. 260-534.00s.

Ezoe, Mitsuhiko; and Inoue, Naohiko, to Nissan Motor Company, Limited. Electric control circuitry for vehicle power steering device. 3,820,619, Cl. 180-79.20r.

Faggin, Federico: *See—*
Hoff, Marcian Edward, Jr.; Mazor, Stanley; and Faggin, Federico, 3,821,715.

Fahrner, Willard F. Apparatus and method for dredging, retention, transport and disposal of dredged material. 3,820,258, Cl. 37-58.000.

Fairbanks, Charles W.; and Leinen, Roger W., to Minnesota Mining and Manufacturing Company. Fabric pattern construction method. 3,821,055, Cl. 156-309.000.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Enders, Edgar; Stendel, Wilhelm; Meier, Jurgen-Dietrich; and Francque, Marc, 3,821,204.

Farber, Hugh A., to Dow Chemical Company, The. Polyethers having oxidized thioether side chains. 3,821,306, Cl. 260-584.00r.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Keil, Gunter, 3,821,168.

Fare, Louis R.; Goore, Moshe; Naylor, James F., III; and Valenta, Joseph R. Smithkline Corporation Antiviral complex of RNA and polysaccharide. 3,821,193, Cl. 260-209.00r.

Farkas, Elizabeth, to General Foods Corporation. Method for preparing low-calorie aerated structure. 3,821,428, Cl. 426-141.000.

Farney, Leonard C.: *See—*
Land, Edwin H.; Bloom, Stanley M.; and Farney, Leonard C., 3,821,000.

Farrar, Grover L., to Celanese Corporation. Polyethylene terephthalate film. 3,821,156, Cl. 260-40.00r.

Fathauer, George H.; and Mathis, Cecil E., to Masco Corporation. Scanning control circuit for use in signal-seeking radio receiver. 3,821,651, Cl. 325-470.000.

Fauran, Claude P.; Douzon, Colette; Raynaud, Guy M.; and Sergant, Micheline Y., to Delalande S.A. Novel derivatives of substituted tetrahydro M-oxazines, their process of preparation and their therapeutic application. 3,821,215, Cl. 260-244.00r.

Faust, Fred W. Sleeve protector. 3,821,338, Cl. 264-35.000.

Fauve, Jean, to SKF Compagnie d'Applications Mecaniques. Method and apparatus for demagnetizing mechanical parts. 3,821,613, Cl. 317-157.500.

Fay, Clarence C. Drum brake shoe actuator. 3,820,637, Cl. 188-106.00p.

Federal Paper Board Company, Inc.: *See—*
Fischer, Edward; and Arneson, Edwin L., 3,820,707.

Fehr, Eric R.: *See—*
Ernstoff, Michael N.; Hoffman, William C.; Fehr, Eric R.; and Winner, Richard N., 3,821,796.

Fehr, Theodor; Stuetz, Peter; and Stadler, Paul. 6-Methyl-8β-ureidoergolenes. 3,821,226, Cl. 260-285.500.

Feiertag, Orrin G., to General Electric Company. Patient handling table. 3,820,176, Cl. 5-63.000.

Feinberg, Robert S., to Cryplex Industries, Inc. Heat-resistant, vapor barrier release coating. 3,821,015, Cl. 117-47.00a.

Feinstone, Wolffe Harry: *See—*
Black, Archie Scott; and Feinstone, Wolffe Harry, 3,821,363.

Feldmann, Ernst: *See—*
Sohnchen, Ernst; and Feldmann, Ernst, 3,821,675.

Fenger, Horst; and Pfeifer, Ferdinand, to Messer Griesheim GmbH. Apparatus for cooling liquids. 3,820,598, Cl. 165-160.000.

Fenn, Darien S.: *See—*
Waugh, James Harry, Jr.; and Fenn, Darien S., 3,820,647.

Feraud, Claude: *See—*
Alessio, Lucien; Chabanis, Michel; and Feraud, Claude, 3,820,404.

Ferberg, Mirriam Borisovna: *See—*
Lishevskaya, Marina Osipovna; Virnik, Alexandr Davidovich; Gabrielian, Genrikh Aramaisovich; Rogovin, Zakhar Alexandrovich; Borbat, Vladimir Fedorovich; Orlov, Alexandr Mikhailovich; Ferberg, Mirriam Borisovna; and Markelova, Nina Ivanovna, 3,821,137.

Ferment, George R.: *See—*
Daley, Lawrence R.; and Ferment, George R., 3,821,013.

Feser, Kurt, to Haefely, Emil, & Cie. AG. Multistage pulse generator. 3,821,561, Cl. 307-110.000.

Fiat Societa per Azioni: *See—*
Salotti, Gianfranco; and Palazzetti, Mario, 3,820,855.

Fiddler, Theodore E. Compact multiple connector apparatus for multiple channels and tubes. 3,820,828, Cl. 285-137.00r.

Fielden Electronics Limited: *See—*
Beck, Maurice Sidney; Calvert, George; Mendies, Patrick John; and Cunlifee, Malcolm, 3,820,392.

Fikhman, Isak Berovich: *See—*
Andreev, Oleg Semenovich; Birjukov, Boris Konstantinovich; Byzov, Yury Mikhailovich; Lekhtman, Moisei Abramovich; Perelberg, Azik Iosifovich; Strimbling, Semen Itskhovich; Trachevsky, Boris Sergeevich; Fikhman, Isak Berovich; Cherepakha, Pavel Andreevich; nd Shraifeld, Tamara Yakovlevna, 3,821,749.

Fildes, Robert Anthony: *See—*
Arnold, Benjamin Harry; Fildes, Robert Anthony; and Gilbert, David Arthur, 3,821,209.

Finck, Patricia A., to Colgate-Palmolive Company. Automatic dishwashing compositions containing rinse agent. 3,821,118, Cl. 252-99.000.

Fine, Samuel: *See—*
Whetstone, Albert L.; Fine, Samuel; and Davis, Robert, 3,821,469.
Whetstone, Albert L.; Fine, Samuel; and Davis, Robert, 3,821,491.

Finley, Joseph H.: *See—*
Blumbergs, John H.; and Finley, Joseph H., 3,821,296.

Firmenich S.A.: *See—*
Torrent, Roger, 3,820,576.

Fischer & Porter Co.: *See—*
Grier, David G., 3,820,571.

Fischer, Edward; and Arneson, Edwin L., to Federal Paper Board Company, Inc. Light bulb package. 3,820,707, Cl. 229-39.00b.

Fischer, John R.: *See—*
Tan, Yen T.; Khosla, Rajinder P.; Fischer, John R.; and Ranadive, Deepak K., 3,820,988.

Fischer, Wilhelm: *See—*
Marks, Helmuth, 3,821,340.

Fischer, William H.: *See—*
Bratkowski, Walter V.; and Fischer, William H., 3,821,507.

Fishbfin, Harry, to Swisstone Corporation. Winding mechanism for music box. 3,820,432, Cl. 84-94.000.

Fisher, Alan J., to SCI Systems, Inc. High-frequency amplifier. 3,821,655, Cl. 330-15.000.

Fisher, Howard M., to Pennsylvania Engineering Corporation. Bottom handling apparatus for steel converter vessels. 3,820,665, Cl. 214-1.00d.

Fitzpatrick, John R., to Etablissement Rafel, mesne. Building structure. 3,820,292, Cl. 52-81.000.

Fix, Delbert D., to Eastman Kodak Company. Dye diffusion transfer elements and process. 3,820,990, Cl. 96-3.000.

Fleck, Fritz: *See—*
Aebli, Horst; Fleck, Fritz; Kittl, Hans; and Schmid, Horst, 3,821,240.

Fleet Electronics Limited: *See—*
Mansfield, John William Brian, 3,821,558.

Flinchbaugh, Donald E., to ExCel Engineering, Incorporated. Apparatus and method for radio frequency sterilization of cigars. 3,820,549, Cl. 131-121.000.

Flournoy, Norman E.; Morris, David A.; Trippet, Raymond; and Dancy, Julian H., to Texaco Inc. Oil burner. 3,820,944, Cl. 431-265.000.

Flowers, I. J.: *See—*
Chang, Nuke Ming; Flowers, I. J.; and Anderson, Gordon M., 3,821,726.

Flowers, Theodore Robert, to Scovill Manufacturing Company. Electric steam iron. 3,820,259, Cl. 38-77.500.

Flowers, Theodore Robert. Steam pressing iron having self-cleaning means. 3,820,260, Cl. 38-93.000.

Fluck, Josef; and Zaugg, Roland, to Schild, A., S.A. Day-date correcting device. 3,820,318, Cl. 58-58.000.

Fluck, Rene, to Schweizerische Industrie-Gesellschaft. Device for the grouping of disc-shaped articles, particularly biscuits. 3,820,649, Cl. 198-35.000.

Flynn, Robert E.: *See—*
Burgess, Norman E.; and Flynn, Robert E., 3,820,710.

FMC Corporation: *See—*
Blumbergs, John H.; and Finley, Joseph H., 3,821,296.
Fylling, Donald R., 3,820,479.
Pizzo, James J.; and Eliott, William W., 3,820,670.
Sheetz, Charles E., 3,820,496.

Fogg, Sidney George: *See—*
Westermann, Peter Henry; and Fogg, Sidney George, 3,821,158.

Foglein, Robert. Device for converting measurement for metric to imperial system and vice versa. 3,820,501, Cl. 116-115.500.

Folley, Milo D., to Inco Systems, Inc. Building structure formed of flat corrugated steel decking. 3,820,295, Cl. 52-270.000.

Ford Motor Company: *See—*
Allison, William D., 3,820,357.

Forgo, Laszlo: *See—*
Heller, Laszlo; Forgo, Laszlo; and Tomcsanyi, Gabor, 3,820,334.

Forgotson, James M. Method of recognizing the presence of hydrocarbons and associated fluids in reservoir rocks below the surface of the earth. 3,820,390, Cl. 73-152.000.

Forinam, George A., to Den-Tal-Ez Mfg. Co. Step attachment for a dental stool. 3,820,844, Cl. 297-432.000.

Forsberg, Jason A. Truck body cover. 3,820,840, Cl. 296-100.000.

Forskningsgruppe for Sjeldne Jordarter: *See—*
Gaudernack, Bjorn; Hannestad, Gunnar; and Hundere, Ingleiv, 3,821,352.

Forster, Denis; and Hershman, Arnold, to Monsanto Company. Production of carboxylic acids. 3,821,265, Cl. 260-413.000.

Forster, Eric O.: *See—*
Bunclark, Edward J.; Harrison, Warrington C.; and Forster, Eric O., 3,821,337.

Foss, Robert Paul, to Du Pont de Nemours, E. I., and Company. Copolymers of pivalolactone and isoprene or butadiene. 3,821,331, Cl. 260-887.000.

Foster, Edwin E. Spring sash counterbalance. 3,820,193, Cl. 16-197.000.

Foster, Harold Marvin, to Sherwin-Williams Company, The. Fungicidal use of certain thiobenzenoid compounds. 3,821,410, Cl. 424-337.000.

Foster Wheeler Corporation: *See—*
Tidball, Robert A.; and Lauro, Gene F., 3,820,333.

Fouche, Jean; and Leger, Andre, to Rhone-Poulenc S.A. Process for the preparation of 10,11-dihydro-dibenzo(B,F)azepinones. 3,821,197, Cl. 260-239.00d.

Fowler, Harold Wayne: *See—*
Anderson, Michael L.; Fowler, Harold Wayne; and McKie, David Alexander, 3,820,421.

Fraenkische Isolierrohr-und Metallwaren-Werke Gebrueder Kirchner: *See—*
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France, David W.: *See—*
Schaefer, Hans F., Jr.; and France, David W., 3,821,498.

Francis, Robert Charles: *See—*
Sawyer, Bobby Gene; and Francis, Robert Charles, 3,820,311.

Francis, Robert Hugh; deceased (by francis, Lillian Lloyd; executrix). Aircraft. 3,820,745, Cl. 244-40.00r.

Francque, Marc: *See—*
Enders, Edgar; Stendel, Wilhelm; Meier, Jurgen-Dietrich; and Francque, Marc, 3,821,204.

Franklin, Benjamin S.: *See—*
Curley, John L.; Donahue, Thomas J.; Franklin, Benjamin S.; Martland, Wallace A.; and Cornaro, Louis V., 3,821,709.

Franz, Helmut, to Boehringer Ingelheim, GmbH. Device for spraying liquid pharmaceuticals. 3,820,698, Cl. 222-205.000.

Franzen, Gustav; and Veltges, Helmut, to Palitex Project-Company GmbH. Pneumatic apparatus for mounting and threading portable manually operated yarn knotter mechanisms on yarn processing machines. 3,820,315, Cl. 57-34.00r.

Fredrickson, Douglas E., to Modelko Tool Company. Battery carrier. 3,820,837, Cl. 294-63.00b.

Free, Kevin W., to Du Pont de Nemours, E. I., and Company. Continuous polymerization of acrylics. 3,821,330, Cl. 260-885.000.

Freeland, Kay: *See—*
Carey, Wayne C., 3,821,007.

Freeman, Fredric R.; Golz, William R.; and Taylor, William K., Jr., to International Business Machines Corporation. Wasp-waist head for

flying flexible magnetic storage medium over head. 3,821,813, Cl. 360-103.000.

Freeman, Gary M.: *See—*
Gilford, Saul R.; Freeman, Gary M.; and Bauman, John H., 3,820,530.

French, John Michael, to Measurex Corporation. Dual wavelength moisture gauge having automatic gain control. 3,821,553, Cl. 250-339.000.

Fretwell, Charles C., to MI², Incorporated. Computer clock for memory module. 3,821,653, Cl. 328-62.000.

Frey, Gerald J.: *See—*
Frey, Gerald J.; Wadler, Milton; and Harrison, Paul H. (said Harrison and said Wadler assors. to), 3,820,886.

Frey, Gerald J.; Wadler, Milton; and Harrison, Paul H., said Harrison and said Wadler assors. to Frey, Gerald J. Endless flexible slide magazine. 3,820,886, Cl. 353-109.000.

Fried, Jean H.: *See—*
Pfister, Jurg R.; Harrison, Ian T.; and Fried, Jean H., 3,821,251.

Fried, John H.: *See—*
Crabbe, Pierre; and Fried, John H., 3,821,288.
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,821,252.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. Naphthyl acetaldehyde derivatives, methods of use thereof and processes for the preparation thereof. 3,821,253, Cl. 260-340.900.

Friedmann, Paul Garson: *See—*
Littman, Bernard; and Friedmann, Paul Garson, 3,820,590.

Friedrich Uhde GmbH: *See—*
Walter, Siegfried; and Schindewolf, Ulrich, 3,821,361.

Friend, Dawson, to Stant Manufacturing Company, Inc. Torque-limiting device. 3,820,680, Cl. 220-39.00r.

Friesen, Dietrich P. Single system sound camera and projector for motion pictures. 3,820,881, Cl. 352-5.000.

Friley, Paul B.: *See—*
Ligon, Elmer R.; and Friley, Paul B., 3,820,826.

Frisch, Hans-Otto; and Payrhammer, Bernd, to Hannes Marker. Toe- or heel-holding device for safety ski bindings. 3,820,803, Cl. 280-11.35m.

Frisen, Lars, to Incentive Research & Development AB. Biomicroscopic eye contact glass. 3,820,879, Cl. 351-1.000.

Frishman, Daniel. Apparatus for knitting pile fabric. 3,820,358, Cl. 66-9.00b.

Frobenius, Wolf D., to Westinghouse Electric Corporation. Charge storage target and method of manufacture. 3,821,092, Cl. 204-15.000.

Fromknecht, Charles T.; and Davis, John C., to Singer Company, The. Vacuum cleaner inlet baffle. 3,820,310, Cl. 55-447.000.

Fromm, Ellsworth H.: *See—*
Schirmer, Robert M.; and Fromm, Ellsworth H., 3,820,320.

Frueh, John J. Brake released throttle holder. 3,820,639, Cl. 192-3.00t.

Fry, William Grant, to Abbott Laboratories. Food flavor composition. 3,821,436, Cl. 426-213.000.

Fryrear, Max D.; and Harmon, James L., to Caterpillar Tractor Co. Bracing arrangement for bulldozer blades. 3,820,610, Cl. 172-803.000.

Fuchs, Werner: *See—*
Bressel, Ulrich; Fuchs, Werner; and Platz, Rolf, 3,821,287.

Fuelling, William, Jr.: *See—*
Borst, Gaylord M.; and Fuelling, William, Jr., 3,820,641.

Fuji Chemicals Industrial Co., Ltd.: *See—*
Asano, Takateru, 3,821,167.

Fuji Jidoki Kabushiki Kaisha: *See—*
Tanaka, Masashi, 3,820,451.

Fuji Photo Film Co., Ltd.: *See—*
Akashi, Goro; and Yamada, Yasuyuki, 3,821,025.
Hashiue, Masakazu; Ueda, Hiroyuki; Honjo, Satoru; and Ooue, Shingo, 3,821,011.
Inuiya, Masafumi, 3,821,623.
Kobayashi, Shunsuke; and Kaneda, Takuji, 3,821,638.
Shirasu, Kazuo; Hatano, Tadao; Shimamura, Isao; Ozawa, Mitsuo; and Iwano, Haruhiko, 3,820,997.
Tsuji, Nobuo; Miyazako, Takushi; Ohkubo, Kinji; and Kato, Kazunobu, 3,820,999.

Fujii, Hiroyasu: *See—*
Saegusa, Takeo; Fujii, Hiroyasu; and Ikeda, Hiroharu, 3,821,125.

Fujii, Tadashiro: *See—*
Abe, Jinnosuke; Watanabe, Tetsuo; Yamaguchi, Tsutomu; Matsumoto, Kunio; and Fujii, Tadashiro, 3,821,081.

Fujimoto, Iwao: *See—*
Akashi, Hajime; Iwai, Sosuke; Fujimoto, Iwao; Hashimoto, Hiroshi; Abe, Tetsuo; Kato, Akira; and Suzuki, Masao, 3,820,623.

Fujimoto, Sakae; Satomi, Tokokazu; Tomizuka, Mituo; Yamauchi, Masayuaki; and Ogawa, Toshiyuki, to Kabushiki Kaisha Ricoh. Sheet stripping device. 3,820,776, Cl. 271-80.000.

Fukushima, Osamu; Sato, Masamichi; and Tamai, Yasuo, to Xerox Corporation. Liquid development method and materials. 3,820,986, Cl. 96-1.0lt.

Fukuzuka, Toshio; Murakami, Tsuyoshi; Urai, Masaaki; and Sakaguchi, Mitutoshi, to Kobe Steel Limited. Process for producing drinking cans made of aluminum-plated steel Sheet. 3,820,368, Cl. 72-47.000.

Fullenwider, James H.: *See—*
Knight, Bruce L.; Rhudy, John S.; and Fullenwider, James H., 3,820,603.

Fumia, Arthur, Jr.; and Heseltine, Donald W., to Eastman Kodak Company. Dyes and photographic emulsion and elements containing said dyes. 3,821,205, Cl. 260-240.00d.

Funke, Gunter, to Daimler-Benz Aktiengesellschaft. Apparatus for manufacturing composite casting of brake-disks. 3,820,588, Cl. 164-288.000.

Fursov, Nikolai Nikolaevich: *See—*
Piven, Grigory Antonovich; Khodich, Nikifor Karpovich; Gapshenko, Alexei Lavrentievich; and Fursov, Nikolai Nikolaevich, 3,820,585.

Furtwangler, Gerhard: *See—*
Aidn, Martin; Furtwangler, Gerhard; and Wanka, Eberhard, 3,821,674.

Fylling, Donald R., to FMC Corporation. Mobile container for safely handling explosives. 3,820,479, Cl. 109-1.000.

Gabrielian, Genrikh Aramaisovich: *See—*
Lishevskaya, Marina Osipovna; Virnik, Alexandr Davidovich; Gabrielian, Genrikh Aramaisovich; Rogovin, Zakhar Alexandrovich; Borbat, Vladimir Fedorovich; Orlov, Alexandr Mikhailovich; Ferberg, Mirriam Borisovna; and Markelova, Nina Ivanovna, 3,821,137.

Gadzala, Anthoni Edward: *See—*
Kinney, James F.; and Gadzala, Anthoni Edward, 3,820,550.

GAF Corporation: *See—*
Daniels, Wiley Edgar; and Duncan, John Julian, 3,821,175.
Lewis, Alan G., 3,820,887.

Gakenholz, Werner: *See—*
Ade, Rolf; and Gakenholz, Werner, 3,821,621.

Gallagher, Ruth, to Stauffer Chemical Company. Graft copolymer additives for vinyl chloride polymer compositions. 3,821,329, Cl. 260-885.000.

Gallatin, Paul M.: *See—*
Halbach, Edward A.; and Gallatin, Paul M., 3,821,531.

Gamajunov, Alexandr Mikhailovich: *See—*
Agushev, Vladimir Alexandrovich; Brusilovsky, Iosif Veniaminovich; Gamajunov, Alexandr Mikhailovich; Lanchikov, Konstantin Vasilievich; Sosner, Jury Moiseevich; Tsodikov, Veniamin Yakovlevich; and Judochkin, Sergei Sergeevich, 3,820,916.

Gamer, Abram Yakovlevich; and Shandalov, Efim Mikhelevich. Fluid-signal indicator. 3,820,396, Cl. 73-308.000.

Gandon, Louis; and Goulaouic, Marie, to Le Nickel. Method for selectively abstracting nickel from an aqueous ammoniacal solution. 3,821,354, Cl. 423-139.000.

Gapshenko, Alexei Lavrentievich: *See—*
Piven, Grigory Antonovich; Khodich, Nikifor Karpovich; Gapshenko, Alexei Lavrentievich; and Fursov, Nikolai Nikolaevich, 3,820,585.

Garcea, Giampaolo, to Alfa Romeo S.p.A. Device for the post-combustion of the unburnt substances in the exhaust gases of the internal combustion engine of a motor vehicle. 3,820,328, Cl. 60-288.000.

Garcia, Jose M. S., to Age Bodegas Unidas, S.A. Bottle with protective and decorative coverings. 3,820,677, Cl. 215-12.00r.

Gared Corporation: *See—*
Boitano, Robert A.; and Engle, Charles J., 3,820,784.

Garner, Joseph L., to Dow Chemical Company, The. Method for expanding microspheres and expandable composition. 3,821,128, Cl. 260-2.50b.

Garratt, Peter Garth; Habermeier, Juergen; Porret, Daniel; and Zuppinger, Paul, to Ciba-Geigy Corporation. Process for the curing of hydantoin containing acrylic acid ester derivatives with ionising rays. 3,821,098, Cl. 204-159.220.

Garvey Corporation: *See—*
Garvey, Francis J., 3,820,650.

Garvey, Francis J., to Garvey Corporation. Sanitary endless belt conveyor. 3,820,650, Cl. 198-204.000.

Gaudernack, Bjorn; Hannestad, Gunnar; and Hundere, Ingleiv, to Forskningsgruppe for Sjeldne Jordarter. Process for separation of yttrium from the lanthanides. 3,821,352, Cl. 423-21.000.

Gause, Raymond L.; and Glenn, C. G., to United States of America, National Aeronautics and Space Administration. Conductive elastomeric extensometer. 3,820,529, Cl. 128-2.00s.

Gay, Alphonse. Curtain suspending device. 3,820,191, Cl. 16-87.200.

Gaynor, Joseph; Anderson, Terry G.; Hines, Walter; and Tyler, Len A., to Bell & Howell Company. Method and apparatus for inductive electrophotography. 3,820,985, Cl. 96-1.00r.

Gaz de France: *See—*
Vignes, Roger, 3,820,945.

Gebel, Kurt M., to Landis Tool Company mesne. Fluid means for locking a machine part in working position. 3,820,443, Cl. 91-420.000.

Gebr, Bohler & Co.: *See—*
Plockinger, Erwin; and Kuhnelt, Gert, 3,820,587.

Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Weber, Karl-Heinz, 3,821,609.

Gee, Glen R.: *See—*
Kliewer, George G.; Roberts, John H.; and Gee, Glen R., 3,820,499.

Gehrke, Gerard W.: *See—*
Marola, Americo E.; and Gehrke, Gerard W., 3,820,640.

Geiszler, Adolph Oscar, to Abbott Laboratories. 1-p-Methoxycinnamoyl)-4-(5-phenyl-4-oxo-2-oxazolin-2-yl)-piperazine as an antimalarial agent. 3,821,379, Cl. 424-250.000.

Gelin, Robert J.; and Sanders, James E., to Owens-Corning Fiberglas Corporation. Apparatus for handling linear elements. 3,821,543, Cl. 242-42.000.

Gendron, Wilfred H.; and Reed, Winslow W., to United States Envelope Company. Method for making personalized letter packages. 3,820,447, Cl. 93-73.000.

Gendron-Diemer, Inc.: *See*—
Limpach, Paul D., 3,820,838.

General Electric Comapny: *See*—
Baker, Walter, Jr., 3,820,351.

General Electric Company: *See*—
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Berger, Abe, 3,821,218.
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Brown, Edgar D., Jr., 3,821,114.
Feiertag, Orrin G., 3,820,176.
Harnden, John D., Jr., 3,821,686.
Hughes, William C., 3,821,582.
Interrante, Leonard V.; and Mitoff, Stephan P., 3,820,402.
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Kornrumpf, William P.; Walden, John P.; and Walker, Loren H., 3,821,630.
Kravitz, Lawrence C., 3,821,616.
Linkous, Clovis E., 3,821,602.
Lister, John W., 3,821,591.
Martin, Donald L., 3,821,035.
Merritt, Will D., Jr.; and Vestergaard, Jorgen H., 3,821,325.
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Redington, Rowland W.; and Henkes, John L., Jr., 3,820,873.
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Shanks, Bruce E., 3,820,207.
Spacil, Henry S., 3,821,362.
Staples, Paul R.; and Dooley, James A., 3,821,681.
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General Foods Corporation: *See*—
Enzie, William Howard; Vanasse, Norman Alfred; Tracy, Gerald Thomas; and Easton, Harry Thomas, 3,821,427.
Farkas, Elizabeth, 3,821,428.
Halladay, Paul D.; and Dougherty, John W., 3,821,443.
Jasovsky, George A.; Rappaneau, Wilfred L.; DeCeglie, Gaetano J.; and Nacci, Anthony T., 3,821,447.
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Mitchell, William A.; and Seidel, William C., 3,821,433.
Reeves, Robert C.; Mansky, Michael; Stavropoulos, Napoleon; Kaleda, William W.; and Richards, William J., 3,821,430.

General Mills Chemicals, Inc.: *See*—
Jordan, Wesley A.; and Carter, Walter H., 3,821,008.

General Motors Corporation: *See*—
Davis, James L.; Lopke, Edward L.; and Pechous, Leslie J., 3,821,562.
Harland, Glen E., Jr.; and Metzger, Robert W., Jr., 3,821,780.
Hurt, Harmon C., 3,820,635.
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Kerr, Lamar L.; Pees, James M.; and Riner, Robert J., 3,820,772.
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Gennaro, Ugo: *See*—
Dall'Asta, Gino; Meneghini, Pietro; and Gennaro, Ugo, 3,821,183.

George, John S. Pipe cutter. 3,820,424, Cl. 82-101.000.

Georgia-Pacific Corporation: *See*—
Gibson, Ronald L.; and Watkins, Charles L., 3,820,706.

Germanas, Dalia; and Pollitzer, Ernest L., to Universal Oil Products Company. Olefin isomerization catalyst. 3,821,123, Cl. 252-439.000.

Germane, Skaidrite Karlovna: *See*—
Lavrinovich, Edvard Stanislavovich; Germane, Skaidrite Karlovna; Treigute, Ilze Edgarovna; and Matisovich, Gunar, 3,821,231.

Ghajar, Parviz, to Honeywell Information Systems, Inc. Method and apparatus for recovering data in an NRZI recording system. 3,821,716, Cl. 340-172.500.

Giansante, Joseph A. Pasteurization atmosphere control system. 3,820,278, Cl. 47-1.100.

Gibson, Ronald L.; and Watkins, Charles L., to Georgia-Pacific Corporation. Fiberboard container. 3,820,706, Cl. 229-34.00r.

Gilbert, David Arthur: *See*—
Arnold, Benjamin Harry; Fildes, Robert Anthony; and Gilbert, David Arthur, 3,821,209.

Gilbert, Dixie E., to Philips Petroleum Company. Method of sealing and blow molding tubular parisons utilizing alternate projections in a sealing member. 3,821,345, Cl. 264-98.000.

Gilchrist, Ralph E.; and Cox, Jack C., to Tenneco Oil Company. Method for the control of oils floating on water. 3,821,109, Cl. 210-36.000.

Gilford Instrument Laboratories Inc.: *See*—
Gilford, Saul R.; Freeman, Gary M.; and Bauman, John H., 3,820,530.

Gilford, Saul R.; Freeman, Gary M.; and Bauman, John H., to Gilford Instrument Laboratories Inc. Cardiac output measuring method and apparatus. 3,820,530, Cl. 128-2.05f.

Gilgen, Hans. Garden installation. 3,820,280, Cl. 47-38.000.

Gillet, Roger, to Societe Generale de Constructions Electriques et Mecaniques (alsthom). Rotor poles for cryo-alternators. 3,821,568, Cl. 310-54.000.

Gillette, Timothy C.: *See*—
Chertok, Allan; and Gillette, Timothy C., 3,821,705.

Giuggioli, Mario: *See*—
Bartalini, Gastone; and Giuggioli, Mario, 3,821,305.

Gladkovsky, Petr Stanislavovich: *See*—
Chernyshev, Petr Sergeevich; Spiridonov, Konstantin Alexeevich; Pakhomov, Vladimir Alexandrovich; Nikolaev, Georgy Vasilievich; Volfson, Izrail Mordukhovich; Levchenko, Boris Leonidovich; Ryzhkov, Viktor Kuzmich; Gladkovsky, Petr Stanislavovich; Shargorodsy, Viktor Semenovich; and Shlyapin, Alexandr Nikolaevich, 3,820,915.

Glaxo Laboratories Limited: *See*—
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Global Marine Inc.: *See*—
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Globe Tool and Engineering Company, The: *See*—
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Gloge, Detlef Christoph, to Bell Telephone Laboratories, Incorporated. Semiconductor drift photodetector for equalization of optical fiber material dispersion. 3,821,549, Cl. 250-211.00j.

Glover, Clarence C.: *See*—
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Godard, Bruno; Yvette, Gif Sur; and Lacour, Bernard, to Compagnie Generale d'Electricite. Traveling wave excited gas laser. 3,821,664, Cl. 331-94.50r.

Godwin, Truman D. Dictating machine-telephone connector link. 3,821,476, Cl. 179-6.00r.

Gohde, Hildegard; and Gohde, Wolfgang. Device for automatic counting and measurement of suspended particles. 3,821,644, Cl. 324-71.0cp.

Gohde, Wolfgang: *See*—
Gohde, Hildegard; and Gohde, Wolfgang, 3,821,644.

Gold, Nicholas, to Polaroid Corporation. Method for constructing a photographic film assemblage. 3,821,049, Cl. 156-73.000.

Goldbach, Manfred; and Rubszinat, Willy, to Hauni-Werke Korber & Co. KG. Apparatus for applying powder to webs of cigarette paper or the like. 3,820,505, Cl. 118-118.000.

Goldenetz, Robert A.: *See*—
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Goldfarb, Adolph E.; and Benkoe, Erwin. Particulate-filled hand-puppet and play doll. 3,820,276, Cl. 46-154.000.

Goldfarb, Adolph E.; and Benkoe, Erwin. Up-hill toy racing game. 3,820,788, Cl. 273-86.00d.

Goldman, Leon: *See*—
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Goldman, Richard L., to Philco-Ford Corporation. Guard ring structure for microwave schottky diode. 3,820,235, Cl. 29-578.000.

Goldmark Communications Corporation: *See*—
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Goldstein, Arthur W., to United States of America, National Aeronautics and Space Administration. Supersonic fan blading. 3,820,918, Cl. 416-223.000.

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Gongolewski, Adolph. Protective cap for a cylindrical tank. 3,820,696, Cl. 224-45.00p.

Good, Paul F., to Speedco, Inc. Knife sharpener. 3,820,289, Cl. 51-247.000.

Goodacre, Cecil; and Leggett, Peter Alfred, to Lansing Bagnall Limited. Industrial lift trucks. 3,820,674, Cl. 214-730.000.

Goodrich, B. F., Company, The: *See*—
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Goodyear Tire & Rubber Company, The: *See*—
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Gould, Grahame Warwick, to Lever Brothers Company. Preservation of packaged foodstuff. 3,821,424, Cl. 426-106.000.

Gouner, Aubrey L., to Wembley Industries, Inc. Device for supporting and forming a necktie knot. 3,820,166, Cl. 2-153.000.

Goyer, Andre; and Smadja, Rene, to Mobil Oil Corporation. Asphaltic compositions. 3,821,144, Cl. 260-28.5as.

Grabendorfer, Werner; Gregor, Manfred; and Schlengermann, Udo, to Krautkramer-Branson Incorporated. Probe system for ultrasonic nondestructive testing. 3,820,387, Cl. 73-67.900.

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Grant, Andrew Campbell, to Union Carbide Corporation. Porous metallic layer formation. 3,821,018, Cl. 117-94.000.

Grant, David, to International Synthetic Rubber Company Limited, The. Polymerisation catalyst. 3,821,186, Cl. 260-94.90e.

Grasmann, Josef. Price marker. 3,821,057, Cl. 156-384.000.

Greeley, Michael. Bar device for keyed locks. 3,820,364, Cl. 70-419.000.

Green, Charles J., to Estes Industries Inc., mesne. Toy rocket motor with pressure-responsive means activated by propellant pressure. 3,820,275, Cl. 46-74.00b.

Greenewald, Herbert, Jr. Indirect arc metal melting furnace. 3,821,455, Cl. 13-9.000.

Greenfield, Jeremy: *See*—
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Griffiths, Roger O.; and Albrecht, Ronald E., to Graco Inc. Hose reel. 3,820,559, Cl. 137-355.160.

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Griot, Rudolf G., to Sandoz-Wander, Inc. Bis-(p-chlorophenoxy) acetic acid esters. 3,821,248, Cl. 260-326.470.

Grip-Pak, Inc.: *See*—
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Groff, Stephen A. Golf carts. 3,820,617, Cl. 180-19.00r.

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Guillot, Jean Claude; Poignant, Pierre; and De Lesseux, de Bazelaire Jacques, to Rhone-Progil. Certain N-thiazol-2-ylureas. 3,821,239, Cl. 260-306.80r.

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Haskins, Richard C. Preventive orthodontic appliance. 3,820,242, Cl. 32-14.00a.

Hassan, Morris, to Chrysler Corporation. Ball joint. 3,820,907, Cl. 403-27.000.

Hasselbacher, Roland E.; and Budds, Warren F., to Caterpillar Tractor Company. Coupling having a solid locking ring. 3,820,829, Cl. 285-226.000.

Hatano, Tadao: *See*—
Shirasu, Kazuo; Hatano, Tadao; Shimamura, Isao; Ozawa, Mitsuo; and Iwano, Haruhiko, 3,820,997.

Hatton, Terence J.: *See*—
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Hattori, Hiroyuki: *See*—
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Hauni-Werke Korber & Co. KG.: *See*—
Goldbach, Manfred; and Rubszinat, Willy, 3,820,505.
Schubert, Bernhard; and Bardenhagen, Dietrich, 3,820,671.

Hausberg, Gerhard; and Hegemann, Karl-Rudolf. Apparatus for scrubbing waste gases. 3,820,307, Cl. 55-226.000.

Hausske, Gene W.: *See*—
Dugan, James G.; Hancock, Albert S., Jr.; Hausske, Gene W.; Huston, Kenneth G.; Rosenberg, Bernard L.; and Smith, Shirley M., 3,820,507.

Hautemont, Jean-Claude, to Rhone-Poulenc-Textile. . 3,820,430, Cl. Yarn transporting apparatus.

Havas, George, to Ajax Magnethermic Corporation. Power control means for a single phase induction melting or heating furnace. 3,821,456, Cl. 13-26.000.

Hayashi, Kuniaki: *See*—
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Hayashi, Masaki: *See*—
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Hayashi, Torahiko. Process for the continuous production of multi-layered food material. 3,821,452, Cl. 426-502.000.

Hayashi, Yoshihiro: *See*—
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Hayashi, Yutaka; and Tarui, Yasuo, to Kogyo Gijutsuin. Diffusion self aligned MOSFET with pinch-off isolation. 3,821,776, Cl. 357-23.000.

Hayashida, Hajime, to Nippon Gakki Seizo Kabushiki Kaisha. Bushing structure for use in pivotally supporting the keys of keyboard musical instruments. 3,820,433, Cl. 84-436.000.

Hayes, David F.; and Roth, Stanley M., to Laurel Color, Inc. Method and apparatus for sensing and regulating the temperature of a fluid. 3,821,516, Cl. 219-497.000.

Hayes, John C.: *See*—
Mitsche, Roy T.; Hayes, John C.; Wilhelm, Frederick C.; and Rausch, Richard E., 3,821,105.

Haynes, Don A. Automatic dialing apparatus. 3,821,487, Cl. 179-90.0ad.

Hayward, Norman G. Illuminated gun sight. 3,820,248, Cl. 33-241.000.

Heald, David L.; and Holm-Kennedy, James W., to Univeristy of California, The Regents of the. Switching transistor with memory. 3,821,784, Cl. 357-63.000.

Heberlien & Co. AG: *See*—
Raschle, Josef, 3,820,317.

Hecht, James L.: *See*—
Haskell, Vernon C.; and Hecht, James L., 3,821,014.

Hecker, Alfred: *See*—
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Hege Advanced Systems Corporation: *See*—
Hege, Douglas W., 3,820,759.

Hege, Douglas W., to Hege Advanced Systems Corporation. Centrifugal mixing apparatus and method. 3,820,759, Cl. 259-24.000.

Hegemann, Karl-Rudolf: *See*—
Hausberg, Gerhard; and Hegemann, Karl-Rudolf, 3,820,307.

Hehl, Karl. Device for the production of plastic bottles by injection blow molding. 3,820,930, Cl. 425-242.00b.

Heilmeier & Weinlein Fabrik fur Oel-Hydraulik A KG (Kommandit-Gesellschaft): *See*—
Brunner, Rudolf; and Zenker, Siegfried, 3,820,568.

Heinbigner, Leonard F. Football practice target. 3,820,787, Cl. 273-55.00b.

Heine, Henry: *See*—
Bako, Lazlo; and Heine, Henry, 3,820,363.

Hellberg, Karl-Heinz; Rudolph, Werner; and Massonne, Joachim, to Kali-Chemie Aktiengesellschaft. Process for the preparation of pentafluoromonoiodoethane. 3,821,321, Cl. 260-653.000.

Hellenkamp, Johann F. Hand operated sprayer with attached head. 3,820,721, Cl. 239-288.500.

Heller, Adam; and Klump, Kirby N., to GTE Laboratories Incorporated. Method for the prevention of photodiscoloration of red meat. 3,821,437, Cl. 426-265.000.

Heller, Hansjorg: *See*—
Brunetti, Heimo; Peterli, Hans-Jakob; Muller, Helmut; and Heller, Hansjorg, 3,821,310.

Heller, Laszlo; Forgo, Laszlo; and Tomcsanyi, Gabor, to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat. Heating power plants. 3,820,334, Cl. 60-688.000.

Heller, Ralph Marc: *See*—
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Hellyer, Henry L., Jr. Atmospheric glycol germicides. 3,821,413, Cl. 424-343.000.

Helmberger, Josef: *See*—
Bestenreiner, Friedrich; Helmberger, Josef; Meyer, Rudolf; and Meeussen, Louis Achilles, 3,820,992.

Hemphill, Dean P.: *See*—
Walker, George E., Jr.; and Hemphill, Dean P., 3,820,601.

Henault, Claude, to Regie Nationale des Usines Renault and Automobiles Peugeot. Temperature regulator for a catalytic reactor. 3,820,327, Cl. 60-286.000.

Hencley, Richard L.; McCumber, Roger D.; and Hewitt, Donald W., to Data Card Corporation. Embossing and encoding system. 3,820,455, Cl. 101-93.00c.

Henderson, Charles R. Tow hitch. 3,820,822, Cl. 280-478.00a.

Henderson, Glenn W.: *See*—
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Henderson, William Weldon, to Du Pont de Nemours, E. I., and Company. Nonwoven polypropylene fabric. 3,821,062, Cl. 161-59.000.

Henkes, John L., Jr.: *See*—
Redington, Rowland W.; and Henkes, John L., Jr., 3,820,873.

Henrick, Clive A., to Zoecon Corporation. Halohydrins of 2,4-di unsaturated aliphatic carboxylic esters. 3,821,264, Cl. 260-408.000.

Henrick, Clive A.; and Siddall, John B., to Zoecon Corporation. Thiolesters of 3-hydroxy-3,7,11,substituted thiol didecenoates of undercenoates. 3,821,269, Cl. 260-455.00r.

Hensel, Robert D., to Armstrong Cork Company. Segmentally accommodating loose-lay floor. 3,821,059, Cl. 161-36.000.

Herl, Hans; Hurlebaus, Klaus; and Sauer, Fritz, to Licentia-Patent-Verwaltungs-G.m.b.H. Apparatus for binding a winding head. 3,820,483, Cl. 112-121.200.

Hermeyer, Bernd, to U.S. Phillips Corporation. Circuit arrangement in particular for X-ray diagnostic apparatus. 3,821,552, Cl. 250-388.000.

Herscher, Marvin B.; and Martin, Thomas B., to Threshold Technology Inc. Cough monitoring apparatus. 3,821,472, Cl. 179-1.0sa.

Hershman, Arnold: *See*—
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Hertrich, Klaus, to Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Folding-blade cylinder for use in rotary folding machines. 3,820,774, Cl. 270-63.000.

Heseltine, Donald W.: *See*—
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Hesslein, Robert J.; Chamberlin, Robert W.; and Lanphere, Gerald B., to Lipe Rollway Corporation. Bar end positioner. 3,820,668, Cl. 214-1.500.

Hewitt, Donald W.: *See*—
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Heyes, James; and Ward, Neal, to Beecham Group Limited. Heterocyclic compounds in pharmaceutical compositions and methods. 3,821,415, Cl. 424-273.000.

Hiatt, Sammy G., to Burlington Industries, Inc. Process and apparatus for liquid treating of textile fabric. 3,820,950, Cl. 8-151.100.

Hickman, Kenneth C. D., to United States of America, Interior. Distillation of saline water by direct contact heat exchange with immiscible liquid. 3,821,089, Cl. 203-10.000.

Hiemke, Rudolph: *See*—
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Hiersig, Heinz M.; and Campbell, George T. R., to Mannesmann-Meer Aktiengesellschaft. Drive system for ships with main and auxiliary engines for additionally driving an electric generator. 3,820,338, Cl. 60-717.000.

Highway Traffic and Safety Corporation: *See*—
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Irikura, Tsutomu; Higo, Kyoichi; Maeda, Akitoshi; Morinaga, Fumihiko; and Naruke, Takeshi, 3,821,378.

Hilgenbrink, John T., to Continental Can Company, Inc. Renecking method. 3,820,486, Cl. 112-120.00m.

Hill, Ivan Winfield: *See*—
Baker, Donald James, Jr.; Hill, Ivan Winfield; and Wearn, Richard B., Jr., 3,820,391.

Hill, Robert H.: *See*—

Matsko, Joseph J.; Hill, Robert H.; and Lange, Emroy W., 3,821,607.
Hillman, Alfred Kimball, Jr.; Wochholz, Harold Frederick; and Penick, Dixon Brown, to Northeast Electronics Corporation. Pulse code modulated time division multiplexed data transmission system. 3,821,478, Cl. 179-15.0af.
Hillman, Melville E. D.: *See*—
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Hilton, Albert R.; and Trachtenberg, Isaac, to United States of America, Interior. Copper ion selective sensor. 3,821,100, Cl. 204-195.00g.
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Hoch, Paul E., to Hooker Chemical Corporation. Bicyclic ketones having biological activity. 3,821,307, Cl. 260-586.00r.
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Hoer, Ralph A., to Ralston Purina Company. Protein fiber forming. 3,821,453, Cl. 426-506.000.
Hofbauer, Peter, to Volkswagenwerk Aktiengesellschaft. Sealing arrangement for a combustion engine with a rotary-type piston. 3,820,926, Cl. 418-144.000.
Hoff, Marcian Edward, Jr.; Mazor, Stanley; and Faggin, Federico, to Intel Corporation. Memory system for a multi-chip digital computer. 3,821,715, Cl. 340-172.500.
Hoffman, William C.: *See*—
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Hoffmann, Manfred, to Siemens Aktiengesellschaft. Speed control system for reversible electrical machine. 3,821,619, Cl. 318-138.000.
Hoffmann, Ralph L., to Prefection Manufacturing Company, The. Grass catcher assembly. 3,820,313, Cl. 56-202.000.
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Hollweck, Walter; and Nadler, Leonhard, to Inter Control Hermann Kohler Elektrik GmbH & Co. KG. Thermostat, particularly for room temperature control. 3,821,682, Cl. 337-380.000.
Holm-Kennedy, James W.: *See*—
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Holzhuter, Erich, to Klein, Schanzlin & Becker Aktiengesellschaft. Suction bend conduit for use with centrifugal pumps. 3,820,570, Cl. 138-39.000.
Homan, William N.; and Stafford, Richard W., to Mallory, P. R., & Co., Inc. Switch actuator pivotal means for a cam operated timer switch assembly. 3,821,503, Cl. 200-38.00r.
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Hong, Young C. Gas range timer control. 3,820,405, Cl. 74-3.500.
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Horinaga, Hiroshi, to Sony Corporation. Switching circuit utilizing gate-controlled switching device. 3,821,565, Cl. 307-252.00b.
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Houghton-Larsen, Erik; and Hansen, Ove Emil, to Aktieselskabet Niro Atomizer. Method for producing a coffee concentrate. 3,821,434, Cl. 426-193.000.
House, Ralph; and Danzik, Michell, to Chevron Research Company. Dialpylphenon sulfate-sulfonate. 3,821,272, Cl. 260-457.000.
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Hoyle, William; and Howarth, Graham Arton, to Ciba-Geigy Corporation. 5-Nitrofuryl derivatives as antibacterial agents. 3,821,382, Cl. 424-251.000.
Hu, Shih-En, to Esso Research and Engineering Company. Olefinic ketone imines and oil compositions containing them. 3,821,302, Cl. 260-566.00r.
Hu, Shih-Ming, to International Business Machines Corporation. Method for producing flat composite semiconductor substrates. 3,821,033, Cl. 148-175.000.
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Hughes, Jack Thomas, 20% to Lee, Raymond, Organization, Inc., The. Mobile collapsible ramp. 3,820,912, Cl. 404-35.000.
Hughes, Oscar R.; and Hillman, Melville E. D., to Celanese Corporation. Production of aldehydes from olefins. 3,821,311, Cl. 260-604.0hf.
Hughes, Thomas R.; Jacobson, Robert L.; and Robinson, Richard C., to Chevron Research Company. Production of high octane gasoline. 3,821,104, Cl. 208-93.000.
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Hulse, Murlin L., to Orbital Container Corporation. Score-line structure. 3,820,681, Cl. 220-54.000.
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Hults, Gerard V. Spool holder-line server. 3,820,737, Cl. 242-129.500.
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Huyffer, Paul S.; and Wasatonic, John J., to Polaroid Corporation. Process for the preparation of 3- (3'-lower carboalkoxy-4'hydroxy - 1'-naphthyl)-3-(3''-carboxy-4''hydroxy-1''-naphthyl) naphthalide. 3,821,254, Cl. 260-343.20r.
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Ichikawa, Mitsuo; Harita, Yoshiyuki; Tashiro, Mitsuru; and Ito, Haruo, to Japan Synthetic Rubber Company Limited. Process for producing cyclic compounds of conjugated diene polymers. 3,821,187, Cl. 260-94.7ha.
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Iketaki, Kazuo; and Hashizaki, Kazuo, to Sony Corporation. Magnetic recording and/or reproducing apparatus. 3,821,467, Cl. 360-70.000.
Ikrath, Kurt. Ferrite loopstick antenna arrays for loran-C receiver. 3,821,743, Cl. 343-748.000.
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Cassidy, John Edward; and Millar, Philip Glenn, 3,821,357.
Imura, Toshinori, to Minolta Camera Kabushiki Kaisha. Shutter release apparatus for camera. 3,821,769, Cl. 354-235.000.
Inamoto, Yoshiaki; and Kadono, Takeji, to Kao Soap Co., Ltd. Method of producing 1,3-bis (cyanomethyl) adamantane. 3,821,275, Cl. 260-464.000.
Incentive Research & Development AB: *See—*
Frisen, Lars, 3,820,879.
Inco Systems, Inc.: *See—*
Folley, Milo D., 3,820,295.
Induction Heating and Engineering Corporation: *See—*
Rylicki, Edward J., 3,821,632.
Industrie AG. Allegro: *See—*
Moor, Wilhelm, 3,820,736.
Ingemarsson, Gosta Ingemar: *See—*
Eriksson, Erik Sture; and Ingemarsson, Gosta Ingemar, 3,820,452.
Ingress Manufacturing Co., Inc.: *See—*
Waldon, Vernon L., 3,820,175.
Injection Plastic Co., Inc., The: *See—*
Strang, Samuel J., 3,820,861.
Inmont Corporation: *See—*
Lattarulo, Charles Joseph; and Civardi, Frank Peter, 3,821,012.
Inose, Fumiyuki: *See—*
Kita, Yuzo; Inose, Fumiyuki; Homma, Noriyuki; and Yasuda, Michio, 3,821,725.
Inoue, Katsumi, to Teipi Service & Sales Corporation. Golf training device. 3,820,794, Cl. 273-183.00b.
Inoue, Naohiko: *See—*
Ezoe, Mitsuhiko; and Inoue, Naohiko, 3,820,619.
Inoue, Tokuta; Sawada, Hiroshi; Ohnaka, Hidemi; and Ohshiro, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Overheat protection for afterburner system. 3,820,326, Cl. 60-277.000.
Institut de Recherches de la Siderugie Francaise (IRSID): *See—*
Vayssiere, Pierre, 3,820,510.
Institut de Recherches de la Siderurgie Francaise: *See—*
Alberny, Robert; and Leclercq, Alain, 3,820,584.
Institutul de Proiectari Al Industriei Usoare: *See—*
Constantinescu, Petre B.; Barthon, Stefan; Dumitrescu, Constantin; and Alexandrescu, Mihail, 3,820,448.
Intel Corporation: *See—*
Hoff, Marcian Edward, Jr.; Mazor, Stanley; and Faggin, Federico, 3,821,715.
Inter Control Hermann Kohler Elektrik GmbH & Co. KG: *See—*
Hollweck, Walter; and Nadler, Leonhard, 3,821,682.
Interactive Systems, Inc.: *See—*
Bennett, Melvin T.; Vlach, Thomas L.; Edwin, Allan I.; and Venturi, Gino, 3,821,706.
International Business Machines Corporation: *See—*
Abbott, Chester D.; Brock, George W.; Robinson, Neil L.; Shelledy, Frank B.; and Smith, Sidney H., 3,821,815.
Besseyre, Jacques A., 3,821,494.
Broadhurst, Dennis; and Moore, Brian B., 3,821,713.
Cannon, Maxwell R., 3,821,798.
Chang, Chi Shih; and Jen, Teh-Sen, 3,821,781.
Devore, Ernest W.; Hall, Phil H.; and Irwin, John W., 3,821,703.
Elam, Robert Runyon; Heller, Ralph Marc; and Muehldorf, Eugen Igor, 3,821,711.
Freeman, Fredric R.; Golz, William R.; and Taylor, William K., Jr., 3,821,813.
Hu, Shih-Ming, 3,821,033.
Oswald, Richard Karl, 3,820,712.
Schwuttke, Guenter Helmut, 3,821,038.
Wolfheimer, Albert Daniel, 3,820,456.
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Hughes, Gordon, 3,821,721.
International Fire Tool Corporation: *See—*
Piffath, Rodney S.; and Cole, John J., 3,820,941.
International Harvester Company: *See—*
De Pauw, Richard A.; and Stamp, Tom G., 3,820,618.
Ebey, Edward W., 3,820,638.
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International Research & Development Company Limited: *See—*
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International Synthetic Rubber Company Limited, The: *See—*
Grant, David, 3,821,186.
International Telephone and Telegraph Corporation: *See—*
Greenwood, Roger; and McGregor, Donald F., 3,820,755.
Interrante, Leonard V.; and Mitoff, Stephan P., to General Electric Company. Electrical pressure transducer. 3,820,402, Cl. 73-398.0ar.
Interrante, Leonard V.; and Wentorf, Robert H., Jr., to General Electric Company. Closed-cycle thermochemical production of hydrogen and oxygen. 3,821,358, Cl. 423-579.000.
Inuiya, Masafumi, to Fuji Photo Film Co., Ltd. Means for detecting operation of servo-system. 3,821,623, Cl. 318-490.000.
Ioffe, Felix Semenovich: *See—*

Rikman, Mikhail Abramovich; and Ioffe, Felix Semenovich, 3,820,469.

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Ionic Industries Incorporated: *See—*
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Ipsen Industries International Gesellschaft mit beschränkter Haftung: *See—*
Limque, Ferdinand; Bertrand, Hans; and Bielefeldt, Irvin P., 3,820,766.

Irikura, Tsutomu; Higo, Kyoichi; Maeda, Akitoshi; Morinaga, Fumihiko; and Naruke, Takeshi. 2-Amino-4,6-diphenethylamino-striazine as active serum cholesterol lowering agent. 3,821,378, Cl. 424-249.000.

Irwin, James S.; and Morton, John R., to Motorola, Inc. Temperature compensated crystal oscillator. 3,821,665, Cl. 331-116.00r.

Irwin, John W.: *See—*
Devore, Ernest W.; Hall, Phil H.; and Irwin, John W., 3,821,703.

Isaac, Donald, Jr.; and Bishop, Clifford F., to Square D Company. Handle extension assembly for a molded case electric circuit breaker. 3,821,532, Cl. 200-330.000.

Ishida, Shuichi: *See—*
Abe, Yasunori; Yamane, Nobuo; Itoh, Kensaku; Ishida, Shuichi; and Kobayashi, Hisabumi, 3,821,312.

Ishiguro, Chiaki: *See—*
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Ishii, Mitsuaki: *See—*
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Ito, Haruo: *See—*
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Ito, Hideo: *See—*
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Itoh, Kensaku: *See—*
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Ivanjukov, Demid Vasilievich: *See—*
Bljumberg, Erna Albertovna; Ivanjukov, Demid Vasilievich; Maslov, Sergei Alexeevich; Norikov, Jury Dmitrievich; Emanuel, Nikolai Markovich; and Boiko, Vladimir Vasilievich, 3,821,259.

Ivkovich, John C.; and Billiteri, Philip. Bicycle accessory. 3,820,819, Cl. 280-231.000.

IWA-Rechenschieberfabrik F. Riehle KG: *See—*
Riehle, Harald, 3,821,521.

Iwai, Sosuke: *See—*
Akashi, Hajime; Iwai, Sosuke; Fujimoto, Iwao; Hashimoto, Hiroshi; Abe, Tetsuo; Kato, Akira; and Suzuki, Masao, 3,820,623.

Iwama, Kiyonori: *See—*
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Iwano, Haruhiko: *See—*
Shirasu, Kazuo; Hatano, Tadao; Shimamura, Isao; Ozawa, Mitsuo; and Iwano, Haruhiko, 3,820,997.

Iwao, Kumiy Roy; and Yee, David, to Continental Oil Company, mesne. Method of assembling nuclear reactor fuel element spacer assembly. 3,820,225, Cl. 29-428.000.

Iyengar, Madhur Srinivas: *See—*
Rao, Vaddadi Siva Bhaskar; Gopinath, Kottil Wallapil; and Iyengar, Madhur Srinivas, 3,821,303.

Jabsen, Felix S., to Babcock & Wilcox Company, The. Pressurized water nuclear reactor with upper and lower core support and positioning means. 3,821,079, Cl. 176-61.000.

Jackson, Charles H., Jr. Aerial signal unit. 3,820,462, Cl. 102-35.600.

Jackson, John A.: *See—*
Szedon, John R.; Jackson, John A.; and Phillips, David C., 3,821,099.

Jackson, Julian H.: *See—*
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Jacobson, Robert L.: *See—*
Hughes, Thomas R.; Jacobson, Robert L.; and Robinson, Richard C., 3,821,104.

Jacoby, Charles H., to Akzona Incorporated. Method of mining a deposit of rock salt or the like. 3,820,847, Cl. 299-5.000.

Jahnke, Horst: *See—*
Ziener, Hermann; Weber, Lothar; Jahnke, Horst; Magenau, Horst; and Zimmermann, Georg, 3,821,028.

Jahrstorfer, George W.: *See—*
Burnell, Dennis G. A.; and Jahrstorfer, George W., 3,820,323.

Jakubowski, Heinz, to Carl Zeiss Stiftung. Automatic diaphragm control for motion picture cameras used on operation microscopes. 3,820,882, Cl. 352-131.000.

James, Lawrence W., to Varian Associates. Avalanche photodiode. 3,821,777, Cl. 357-30.000.

James, Michael: *See—*
Milik, Rudolf F. L., 3,820,760.

Jamin, C., N.V.: *See—*
Jamin, Everard Joseph Maria, 3,821,423.

Jamin, Everard Joseph Maria, to Jamin, C., N.V. Hollow article made of chocolate. 3,821,423, Cl. 426-106.000.

Janiak, Stefan; and Rohr, Otto, to Ciba-Geigy AG. Fungicidal preparations containing benzimidazole compounds. 3,821,393, Cl. 424-273.000.

Janka, John C., to Consolidated Natural Gas Service Company, mesne. Refuse gasification process and apparatus. 3,820,964, Cl. 48-113.000.

Jansen, Gert Peter, to Beecham Group Limited. Chemical process. 3,821,250, Cl. 260-329.00r.

Jansen, Herbert, to Mannesmann-Meer Aktiengesellschaft. Machine for bending sheet stock. 3,820,378, Cl. 72-465.000.

Jansson, Sven A.; and Gulbransen, Earl A., to Westinghouse Electric Corporation. Tungsten-halogen incandescent lamp with group IVA metal getter, and method of manufacture. 3,821,585, Cl. 313-178.000.

Japan Exlan Company Limited: *See—*
Matsumura, Yasuo; and Maruyama, Kunio, 3,821,173.

Japan Gasoline Co., Ltd.: *See—*
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Japan Synthetic Rubber Co., Ltd.: *See—*
Saegusa, Takeo; Fujii, Hiroyasu; and Ikeda, Hiroharu, 3,821,125.

Japan Synthetic Rubber Company Limited: *See—*
Ichikawa, Mitsuo; Harita, Yoshiyuki; Tashiro, Mitsuru; and Ito, Haruo, 3,821,187.

Japenga, Ronald, to Reliable Electric Company. Telephone line loop extender. 3,821,483, Cl. 179-16.00f.

Jasinski, Andrew S. Spray can safety cap. 3,820,683, Cl. 220-60.00a.

Jasovsky, George A.; Rappaneau, Wilfred L.; DeCeglie, Gaetano J.; and Nacci, Anthony T., to General Foods Corporation. Method for producing stabilized coffee aromas. 3,821,447, Cl. 426-386.000.

Jeanmaire, Walter. Machine for opening cotton bales. 3,820,197, Cl. 19-80.000.

Jefferts, Keith B. Tag implanting machine. 3,820,545, Cl. 128-330.000.

Jen, Teh-Sen: *See—*
Chang, Chi Shih; and Jen, Teh-Sen, 3,821,781.

Jenkins, Roger M.: *See—*
Streeter, John H.; and Jenkins, Roger M., 3,820,407.

Jenner, Heinrich; and Schmidt, Georg, to Fraenkische Isolierrohr-und Metallwaren-Werke Gebrueder Kirchner. Corrugated plastic pipe and drainage system using the same. 3,820,340, Cl. 61-11.000.

Jernigan, James L., to United States of America, Navy. Inverted time umpulsed bragg angle matched filter. 3,821,548, Cl. 250-216.000.

Jerre, Sven Torsten: *See—*
Martensson, Kjell Halvard; Linde, Bjorn H:son; Palsson, Jan Frederik; and Jerre, Sven Torsten, 3,820,303.

Jett, Howard V.; and De Marco, Joseph V. Aggregate spray gun. 3,820,722, Cl. 239-373.000.

Jhaveri, Chandrakant R.: *See—*
Montgomery, Kenneth O.; and Jhaveri, Chandrakant R., 3,821,192.

Jines, Chester G. Baggage lift for motels. 3,820,632, Cl. 187-3.000.

Joeckel, Stanley V., to Lincoln Manufacturing Company, Inc. Program timer with adjustable cam having shaft locking and removal means. 3,821,502, Cl. 200-38.0ba.

Johansson, Arne; and Lyckstedt, Bertil, to Allmanna Svenska Elektriska Aktiebolagt. Enclosed surge diverter. 3,821,608, Cl. 317-62.000.

Johns, William B.: *See—*
Iadipaolo, Rene M.; and Johns, William B., 3,821,624.

Johns-Manville Corporation: *See—*
Johnson, Charles William, 3,820,967.

Johnson & Johnson: *See—*
Drelich, Arthur H.; and Bowman, Bobby R., 3,821,146.
Mohammed, Kasheed, 3,821,432.

Johnson, Bruce K.; and Reynard, John M., to Polaroid Corporation. Non-folding tripod adapter. 3,821,771, Cl. 354-293.000.

Johnson, Charles William, to Johns-Manville Corporation. Filament production monitor. 3,820,967, Cl. 65-2.000.

Johnson, David E., to Mobil Oil Corporation. Method and apparatus for extrusion of thermoplastics. 3,821,129, Cl. 260-2.50e.

Johnson, Edward B. Composition for reducing co emission. 3,820,962, Cl. 44-56.000.

Johnson, Floyd C., to Dow Chemical Company, The. Film size control apparatus and method. 3,821,339, Cl. 264-40.000.

Johnson, Harold E. Underwater sewage collection system for docked boats. 3,820,488, Cl. 114-.50r.

Johnson, Herbert G.: *See—*
Hall, Charles M.; and Johnson, Herbert G., 3,821,227.

Johnson, LeRoy E.: *See—*
Argoudelis, Alexander D.; and Johnson, LeRoy E., 3,821,367.

Johnson, Matthey & Co., Limited: *See—*
Darling, Alan Sydney, 3,821,030.

Johnson, Robert F., to Phillips Petroleum Company. Polyolefin blends with occluded nitrogenous heterocyclic polyamides in the fibers differentially dispersed dyes. 3,820,949, Cl. 8-21.00b.

Johnson, Robert Phillip, to Abbott Laboratories. Accelerating the lysis of blood clots. 3,821,365, Cl. 424-94.000.

Johnsson, Lennart Birger Valentin, to Aktiebolaget Volvo. Wheel suspension sealing. 3,820,810, Cl. 280-96.200.

Jolly, Michael P.; Quellette, Norman P.; Vitti, Rudolf A.; and Pinzone, Salvatore M., to General Foods Corporation. Process for manufacturing instant coffee and the product of said process. 3,821,429, Cl. 426-147.000.

Jonathan, Isaac; and Madden, John W., to Hallmark Cards, Incorporated. Illuminated product display fixture for edge lighting displayed articles. 3,821,538, Cl. 240-2.0ad.

Jones, Augustin. Surgical device with suction means. 3,820,533, Cl. 128-79.000.

Jones, Stanley W.: *See*—
Nye, William M.; and Jones, Stanley W., 3,821,802.

Jones, Sydney, to Minister of Supply, in Her Majesty's Government. Radiation detection system comprising two sets of filters for effective chopping. 3,821,551, Cl. 250-233.000.

Jordan, Wesley A.; and Carter, Walter H., to General Mills Chemicals, Inc. Suspending agent for refractory paints. 3,821,008, Cl. 106-209.000.

Jordon, William E., to Xerox Corporation. Mistrack interlock for selenium belt. 3,820,888, Cl. 355-3.00r.

Judochkin, Sergei Sergeevich: *See*—
Agushev, Vladimir Alexandrovich; Brusilovsky, Iosif Veniaminovich; Gamajunov, Alexandr Mikhailovich; Lanchikov, Konstantin Vasilievich; Sosner, Jury Moiseevich; Tsodikov, Veniamin Yakovlevich; and Judochkin, Sergei Sergeevich, 3,820,916.

Juergens, Dieter C., to American Hoist & Derrick Company. Crawler vehicle with dual extensible side frames. 3,820,616, Cl. 180-9.480.

Jufa, Tatyana Lvovna; Poletaeva, Irina Alexandrovna; Kormer, Vitaly Abramovich; Babitsky, Boris Davydovich; Lobach, Mark Iosifovich; Markova, Viktoria Vladimirovna; and Churlyaeva, Lidia Alexandrovna. Process for producing linear polymers of alicyclic compunds. 3,821,181, Cl. 260-91.500.

Julian, Percy L. Preparation of wool wax alcohol product of low cholesterol content useful as dispersing and emulsifying agent. 3,821,121, Cl. 252-351.000.

Junck, John A.; and Scheidt, James E. Self-loading scraper hydraulic control system with automatic load relieving circuit. 3,820,257, Cl. 37-8.000.

Junes, Norman E.; and Stanyer, William R. Skyline clamp for logging carriage. 3,820,663, Cl. 212-99.000.

Jureit, John Calvin: *See*—
Castillo, Adolfo; Csakvary, Oscar; and Jureit, John Calvin, 3,820,502.

Justice, Roger L.: *See*—
Shema, Bernard F.; Brink, Robert H., Jr.; and Justice, Roger L., 3,821,396.

Kabushiki Kaisha Ricoh: *See*—
Fujimoto, Sakae; Satomi, Tokokazu; Tomizuka, Mituo; Yamauchi, Masayuaki; and Ogawa, Toshiyuki, 3,820,776.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Seo, Kiyokazu; Hayashi, Yoshihiro; Hoshino, Tunekichi; and Masuda, Fumiyoshi, 3,820,843.

Kabushiki Kaisha Tokai Riku Denki Seisakusho: *See*—
Hotta, Yoichi, 3,821,477.

Kadlec, Jerry T.: *See*—
Questi, Charles, Sr.; Kadlec, Jerry T.; and Questi, Charles J., Jr., 3,820,763.

Kadono, Takeji: *See*—
Inamoto, Yoshiaki; and Kadono, Takeji, 3,821,275.

Kaelin, Joseph Richard. Sewage treatment plant equipped with an aeration impeller. 3,820,764, Cl. 261-91.000.

Kageler, Peter: *See*—
Klein, Friedrich; and Kageler, Peter, 3,821,723.

Kaiser, Richard B.; and Schoen, Werner A., to Scott Paper Company. Support structure for supporting a moving web-forming wire in a forming zone. 3,821,077, Cl. 162-351.000.

Kaldenberg, Henry J., to Maytag Company, The. Appliance door control mechanism. 3,820,866, Cl. 312-276.000.

Kaleda, William W.: *See*—
Reeves, Robert C.; Mansky, Michael; Stavropoulos, Napoleon; Kaleda, William W.; and Richards, William J., 3,821,430.

Kalen, Stuart E., to Cogsdill Tool Products, Inc. Burnishing tool for a flat surface. 3,820,210, Cl. 29-90.000.

Kali-Chemie Aktiengesellschaft: *See*—
Hellberg, Karl-Heinz; Rudolph, Werner; and Massonne, Joachim, 3,821,321.

Kalina, Vladimir; and Nicolas, Pierre, to Societe d'Assistance Technique pour Produits Nestle S.A. Extraction of proteins from microorganism cells. 3,821,080, Cl. 195-5.000.

Kallage, Richard G., Jr.; and Madland, Robert C., to Illinois Tool Works Inc. Musical instrument pushbutton key operated switch with adjustable plunger key cap. 3,821,529, Cl. 200-159.00r.

Kalmus, Henry P. Ratio fuze. 3,821,737, Cl. 343-7.0pf.

Kalopissis, Gregoire; and Manoussos, Georges, to L'Oreal. Oral treatment of seborrhea and compositions for use in said treatment. 3,821,405, Cl. 424-319.000.

Kamezawa, Yasutoki: *See*—
Nihyakumen, Kouzi; Yokoyama, Taizo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,820,996.

Kamoto, Hidetoshi: *See*—
Nagakura, Katsuhiko; and Kamoto, Hidetoshi, 3,821,535.

Kampe, Marcis M., to Enthone, Incorporated. Bright tin electrodepositing additive composition. 3,821,094, Cl. 204-54.00r.

Kane, John F. Body waist exerciser. 3,820,781, Cl. 272-57.00r.

Kane, Robert J. Swimming pool cleaning apparatus. 3,820,172, Cl. 4-172.150.

Kaneda, Takuji: *See*—
Kobayashi, Shunsuke; and Kaneda, Takuji, 3,821,638.

Kanetaka, Junichi; Shimodiara, Takashi; and Hayashi, Kuniaki, to Mitsubishi Petrochemical Company Limited. Production of N-vinyl pyrrolidone. 3,821,245, Cl. 260-326.5fn.

Kang, George S., to Bunker-Ramo Corporation, The. Method and apparatus for walsh function filtering. 3,821,527, Cl. 235-152.000.

Kantor, Illya Solomonovich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Kantor, Iliya Solomonovich; Maslov, Viktor Semenovich; and Alexeev, Gennady Mikhailovich, 3,820,740.

Kanunov, Mikhail Alexeevich: *See*—
Alexandrovich, Eduard-Gely Vitalievich; Belkin, Nikolai Vasilievich; Zelensky, Konstantin Fedorovich; Kanunov, Mikhail Alexeevich; Razin, Anatoly Alexandrovich; Tarasova, Ljudmila Viktorovna; Toropov, Anatoly Pavlovich; Troshkin, Ivan Andreevich; Khudyakov, Ljubov Nikolaevna; Tsukerman, Veniamin Aronovich; Dron, Ninel Alexeevna; Sloeva, Galina Nikolaevna; Ioffe, Jury Konstantinovich; and Vasiliev, Vasily Vasilievich, 3,821,580.

Kao Soap Co., Ltd.: *See*—
Inamoto, Yoshiaki; and Kadono, Takeji, 3,821,275.
Tomita, Tsutomu; Mizukoshi, Masahiko; Ogiwara, Shinichi; and Maeda, Ayahiko, 3,821,441.

Kappenhagen, George A.; and Tabor, James B., to Westinghouse Electric Corporation. Regulated dimmer for incandescent lamps. 3,821,601, Cl. 315-311.000.

Karch, Ludwig; and Nowack, Siegfried, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Guidance means for magnetically suspended railway vehicles. 3,820,470, Cl. 104-148.0ms.

Karlstedt, Sten Lennart, to Telefonaktiebolaget L M Ericsson. Telecommunication cable, particularly paired cable with improved relative crosstalk properties for certain pairs. 3,821,465, Cl. 174-113.00r.

Karnes, George T., to Shell Oil Company. Selectively perforating and treating a cased well. 3,820,604, Cl. 166-297.000.

Kase, Kiyoshi; and Kyu, Shikun, to Motorola, Inc. Phase lock loop electronic tuning system. 3,821,650, Cl. 325-423.000.

Kaser, Rene: *See*—
Braadestini, Antonio; Siegwart, Hans Rudolf; and Kaser, Rene, 3,820,832.

Kass, John Joseph, to Deere & Company. Self-adjusting control linkage for an external band brake. 3,820,636, Cl. 188-7.00r.

Kasugai, Hiroshi: *See*—
Kawada, Seigo; Ito, Hideo; Matsui, Kazuo; and Kasugai, Hiroshi, 3,821,395.

Katagi, Kazuo; Ross, Walter Lee; and Lyon, John Jeffrey, to RCA Corporation. Glich free vector generation. 3,821,728, Cl. 340-324.00a.

Kato, Akira: *See*—
Akashi, Hajime; Iwai, Sosuke; Fujimoto, Iwao; Hashimoto, Hiroshi; Abe, Tetsuo; Kato, Akira; and Suzuki, Masao, 3,820,623.

Kato, Kazunobu: *See*—
Tsuji, Nobuo; Miyazako, Takushi; Ohkubo, Kinji; and Kato, Kazunobu, 3,820,999.

Kato, Masao: *See*—
Kishi, Shigeichi; and Kato, Masao, 3,820,769.

Kato, Saburo, to Ricoh Co., Ltd. Device for moving magnetic head away from magnetic sheet in magnetic recording and reproducing apparatus of the spiral track type. 3,821,812, Cl. 360-101.000.

Kato, Takashi: *See*—
Sugiura, Takahisa; Arai, Nobuyasu; Kato, Takashi; and Hotta, Hiroshi, 3,821,172.

Kato, Teruo: *See*—
Sugita, Yoshimitsu; Kato, Teruo; Sugawara, Katsuro; and Tamura, Masao, 3,821,783.

Katoh, Reichi. Process for producing a structural concrete block. 3,821,347, Cl. 264-162.000.

Katsuda, Yoshio; and Ohno, Takashi, to Sumitomo Chemical Company, Ltd. and Dainippon Jochugiku Company, Ltd. Certain 5-alkynyl-2-furylmethyl esters of 2,2,3,3-tetramethyl cyclopropane carboxylic acid. 3,821,260, Cl. 260-347.400.

Katt, Herbert L. Highway sign post. 3,820,906, Cl. 403-2.000.

Katunich, Samuel; and McKelvey, George C., to United States Steel Corporation. Method of starting tubes through drawing die. 3,820,230, Cl. 29-470.300.

Katz, Carlos: *See*—
Bahler, George; and Katz, Carlos, 3,821,640.

Katz, Helmut, to Siemens Aktiengesellschaft. Zirconium-carbon getter member. 3,820,919, Cl. 417-48.000.

Katz, Helmut; and Huebner, Erwin, to Siemens Aktiengesellschaft. Storage cathode particularly a MK cathode. 3,821,589, Cl. 313-346.00r.

Katzakian, John. Can holding device for serving. 3,820,511, Cl. 222-475.000.

Kaufholz, Frank H., Jr., to Computer Peripherals, Inc. Cartridge opener device. 3,821,809, Cl. 360-95.000.

Kaufman, Warner B.; and Breitwieser, Roland, to VEB Filmfabrik Wolfen. High current electrical lead. 3,821,462, Cl. 174-15.00c.

Kaugars, Girts, to Upjohn Company, The. Chloro substituted furfural phenyl hyorazones. 3,821,261, Cl. 260-347.700.

Kawada, Seigo; Ito, Hideo; Matsui, Kazuo; and Kasugai, Hiroshi, to Mitsubishi Chemical Industries Limited. N-(4-Fluorophenyl)-2,3-dichloromaleimide used as a fungicide. 3,821,395, Cl. 426-45.000.

Kawada, Toshio; Torama, Tadashi; and Kobayashi, Tamio, to Matsushita Electric Industrial Co., Ltd. Magnetic tape recording and reproducing apparatus operable with tape cartridge and having fast forward mechanism. 3,821,807, Cl. 360-93.000.

Kawasaki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Measuring method and apparatus which compensate for Abbe's error. 3,820,902, Cl. 356-106.000.

Keating, Richard T. Remote setting thermoswitch. 3,821,684, Cl. 337-392.000.

Keil, Gunter, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the preparation of linear polyamides containing sulfonate groups. 3,821,168, Cl. 260-49.000.

Keio Giken Kogiyo Kabushikiksishiya: *See*—
Mieda, Fumio, 3,821,461.

Kelly, Robert C., to Upjohn Company, The. Process for preparing bicyclic lactone diols. 3,821,255, Cl. 260-343.300.

Kennametal Inc.: *See*—
Kniff, Thomas J., 3,820,848.

Kennedy, C. Bruce; and Pasieka, John F., to Polaroid Corporation. Compact automatic photostudio. 3,821,760, Cl. 354-76.000.

Kennedy, James D., to Beatrice Foods Company. Spoke mountable display device with integral bracket. 3,820,852, Cl. 301-37.00r.

Kent, Peter Michael, to Brico Engineering Limited. Method of making a fuel injector. 3,820,213, Cl. 29-156.70r.

Kern, Hall S.; and Barnes, Murphy L., Jr., to Environmental Design, Inc. Waterconserving methods and apparatus for flush toilets. 3,820,170, Cl. 4-18.000.

Kerr, Lamar L.; Pees, James M.; and Riner, Robert J., to General Motors Corporation. Energy absorbing unit. 3,820,771, Cl. 267-116.000.

Kerr, Lamar L.; Pees, James M.; and Riner, Robert J., to General Motors Corporation. Energy absorbing unit. 3,820,772, Cl. 267-116.000.

Kerr-McGee Chemical Corporation: *See*—
Lai, San-Cheng, 3,821,096.

Kerr-McGee Chemical Corporation, mesne: *See*—
Wells, Wayne W.; Christie, James R.; and Jackson, Julian H., 3,820,976.

Kerr-McGee Corporation: *See*—
Lucid, Michael Francis, 3,821,351.

Kevranbachian, Rene. Machine to stuff toys. 3,820,575, Cl. 141-18.000.

Keyser, Lewis R., to Price Brothers Company. Pipe structure. 3,820,572, Cl. 138-105.000.

Khananashvili, Lotary Mikhailovich: *See*—
Korshak, Vasily Vladimirovich; Andrianov, Kuzma Andrianovich; Gribova, Irina Alexandrovna;' Krasnov, Alexandr Petrovich; Khananashvili, Lotary Mikhailovich; Vasilieva, Tatyana Vsevolodovna; Elerdashvili, Georgy Vasilievich; Gureeva, Galina Ilinichna; Kotov,Valery Mikhailovich; and Brontman, Rostislav Lazarevich, 3,821,112.

Khodich, Nikifor Karpovich: *See*—
Piven, Grigory Antonovich; Khodich, Nikifor Karpovich; Gapshenko, Alexei Lavrentievich; and Fursov, Nikolai Nikolaevich, 3,820,585.

Khosla, Rajinder P.: *See*—
Tan, Yen T.; Khosla, Rajinder P.; Fischer, John R.; and Ranadive, Deepak K., 3,820,988.

Khudyakova, Ljubov Nikolaevna: *See*—
Alexandrovich, Eduard-Gely Vitalievich; Belkin, Nikolai Vasilievich; Zelensky, Konstantin Fedorovich; Kanunov, Mikhail Alexeevich; Razin, Anatoly Alexandrovich; Tarasova, Ljudmila Viktorovna; Toropov, Anatoly Pavlovich; Troshkin, Ivan Andreevich; Khudyakov, Ljubov Nikolaevna; Tsukerman, Veniamin Aronovich; Dron, Ninel Alexeevna; Sloeva, Galina Nikolaevna; Ioffe, Jury Konstantinovich; and Vasiliev, Vasily Vasilievich, 3,821,580.

Kidwell, William R.: *See*—
Knazek, Richard A.; Gullino, Pietro M.; Dedrick, Robert L.; and Kidwell, William R., 3,821,087.

Kiebala, Jan. Night driving glare shields. 3,820,164, Cl. 2-10.000.

Kihara, Nobutoshi, to Sony Corporation. Magnetic recording and/or reproducing system. 3,821,787, Cl. 358-4.000.

Kikuchi, Masafumi: *See*—
Takeda, Masashi; and Kikuchi, Masafumi, 3,821,656.

Kil, Ilya Genrikhovich: *See*—
Nikiforov, Vladimir Pavlovich; Nosikov, Vasily Ivanovich; Kil, Ilya Genrikhovich; Tsybukov, Igor Kirillovich; Smorodinov, Alexandr Nikolaevich; Tsyplakov, Anatoly Mikhailovich; Budkevich, Nikolai Pavlovich; and Vykhodov, Nikolai Ivanovich, 3,821,101.

Kimball, Stephen F.; Warren, Bernard J.; and Brooks, David N., to GTE Sylvania Incorporated. Thermally responsive non-resettable electric switch. 3,821,685, Cl. 337-409.000.

Kimberly-Clark Corporation: *See*—
Suchane, David V., 3,821,350.

Kimmel, Donald S.; and Paice, Derek A., to Westinghouse Electric Corporation. Capacitor charging circuit. 3,821,635, Cl. 323-102.000.

Kimura, Hirohumi: *See*—
Sugano, Katsumi; Ikegami, Yoshio; and Kimura, Hirohumi, 3,821,511.

Kindl, Helmut; and Met, Viktor, said Kindl assor. to Siemens Aktiengesellschaft. Device for producing a light plane. 3,820,903, Cl. 356-138.000.

King, Graham E., to Atlantic Richfield Company. Well drilling method and apparatus. 3,820,611, Cl. 175-57.000.

King, Robert E., to Cushioned Products Corporation. Granular cork-polyurethane composition and products thereof. 3,821,135, Cl. 260-9.000.

King, Terrance M.; and Pearne, Frank S., to Aircraft Mechanics, Inc. Platform lift mechanism. 3,820,631, Cl. 182-141.000.

King-Seeley Thermos Co.: *See*—
Kohl, Vance L.; and Utter, Robert P., 3,820,354.

Kinney, James F.; and Gadzala, Anthoni Edward, to Avon Products, Inc. Treatment for improving curl retention, luster, manageability, strength and other mechanical properties. 3,820,550, Cl. 132-7.000.

Kinzel, Walter: *See*—
Wagner, Gerhard; and Kinzel, Walter, 3,820,181.

Kirsch, Albert. Wall surfacing die with support and moving means. 3,820,936, Cl. 425-469.000.

Kirsch, Bernhard. Manufacture of frames. 3,820,298, Cl. 52-475.000.

Kishi, Shigeichi; and Kato, Masao, to Cocast AG. Ladle swing tower for a continuous casting installation. 3,820,769, Cl. 266-38.000.

Kishimoto, Fumitaka: *See*—
Ogino, Shigeo; Kishimoto, Fumitaka; and Wada, Hiroo, 3,821,203.

Kishino, Shigeo; Kudamatsu, Akio; Shiokawa, Kozo; and Yamaguchi, Shinich, to Bayer Aktiengesellschaft. O-Ethyl-s-alkyl-s-phthalimido-alkyl-phosphorodithiolates. 3,821,246, Cl. 260-326.00e.

Kita, Yuzo; Inose, Fumiyuki; Homma, Noriyuki; and Yasuda, Michio, to Hitachi, Ltd. Magnetic domain circuit arrangement. 3,821,725, Cl. 340-174.0tf.

Kitai, Kiyoshi. Shutter release mechanism with change-over device for flash photography. 3,821,756, Cl. 354-33.000.

Kitamura, Masaharu; Murakami, Kiyohiko; and Watanabe, Hiromu, to Kuroi Electric Industrial Company. Collapsible type lighting fixture. 3,821,542, Cl. 240-145.000.

Kittl, Hans: *See*—
Aebli, Horst; Fleck, Fritz; Kittl, Hans; and Schmid, Horst, 3,821,240.

Kiuchi, Mitsuyuki: *See*—
Amagami, Keizo; Mori, Hazime; Kobayashi, Takao; Kiuchi, Mitsuyuki; and Ogino, Yoshio, 3,821,509.

Klar, John; and Lizotte, Robert H., to Cincinnati Milacron-Heald Corporation. Grinding machine. 3,820,287, Cl. 51-165.00r.

Klein, Dietrich J.: *See*—
Acker, Donald F.; and Klein, Dietrich J., 3,821,048.

Klein, Friedrich; and Kageler, Peter, to DIEHL, Firma. Data storage circuit. 3,821,723, Cl. 340-173.0rc.

Klein, Joseph F. M.: *See*—
Beekhuis, Gerrit E.; and Klein, Joseph F. M., 3,821,274.

Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Holzhuter, Erich, 3,820,570.

Kleiner, Eduard Karl, to Ciba-Geigy Corporation. Amides and imides of fluorinated alkylamines and maleic and other ethylenically unsaturated dibasic acids and polymers thereof. 3,821,299, Cl. 260-561.00n.

Kleinman, Joseph. Simulated telephone flashlight. 3,821,539, Cl. 240-6.45r.

Klemchuk, Peter. Bis-(3,5-di-tertiary butyl-4-hydroxy-benzyl) hydroxylamine. 3,821,304, Cl. 260-570.900.

Klievoneit, Harold R. Damage proof discfile for storing magnetically encoded information. 3,821,811, Cl. 360-98.000.

Kliewer, George G.; Roberts, John H.; and Gee, Glen R., to Minnesota Mining and Manufacturing Company. Thermally responsive cooking indicator. 3,820,499, Cl. 116-114.500.

Klimaszewski, Richard A.; and Court, Kenneth, to Sperry Rand Corporation. Power transmission. 3,820,920, Cl. 417-213.000.

Kline, Gaylen O., to National Machinery Company, The. Power feed and uncoiler for hot forging machines or the like. 3,820,367, Cl. 72-17.000.

Klingler, Karl Heinz, to Duetsche Gold-und Silber-Scheideanstalt vormals Roessler. Substituted aminoalkyl guanidines. 3,821,301, Cl. 260-564.00a.

Klink, Walter. Prime mover of the radial engine type. 3,820,445, Cl. 91-481.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Wagner, Gerhard; and Kinzel, Walter, 3,820,181.

Kloos, Albert, to Celanese Coatings & Specialties Company. Fire retardant multicolored coating composition. 3,821,155, Cl. 260-37.0ep.

Klump, Kirby N.: *See*—
Heller, Adam; and Klump, Kirby N., 3,821,437.

Klygis, Mindaugas Julius; and Owen, Ronald Charles, to Illinois Tool Works Inc. Container carrier. 3,820,657, Cl. 206-166.000.

Knapp, Wallace C. Reciprocating tool with balanced dual air cylinders. 3,820,440, Cl. 91-40.000.

Knazek, Richard A.; Gullino, Pietro M.; Dedrick, Robert L.; and Kidwell, William R., to United States of America, Health, Education and Welfare. Cell culture on semi-permeable tubular membranes. 3,821,087, Cl. 195-127.000.

Kniff, Thomas J., to Kennametal Inc. Rotary mining tool and keeper arrangement therefor. 3,820,848, Cl. 299-86.000.

Knifton, John F.; and Schwager, Irving, to Texaco Inc. Process for preparing ketones. 3,821,309, Cl 260-586.00r.

Knight, Bruce L.; Rhudy, John S.; and Fullenwider, James H., to ICI American Inc. Altering relative permeability in production wells. 3,820,603, Cl. 166-295.000.

Knisch, Boris, to Knisch Enterprises, Inc. Rotary motor means. 3,820,515, Cl. 123-8.410.

Knisch Enterprises, Inc.: *See—*
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Knoblock, James O.: *See—*
Woollen, J. Michael; and Knoblock, James O., 3,821,257.

Kobayashi, Hisabumi: *See—*
Abe, Yasunori; Yamane, Nobuo; Itoh, Kensaku; Ishida, Shuichi; and Kobayashi, Hisabumi, 3,821,312.

Kobayashi, Shunsuke; and Kaneda, Takuji, to Fuji Photo Film Co., Ltd. Hall effect measuring apparatus. 3,821,638, Cl. 324-45.000.

Kobayashi, Takao: *See—*
Amagami, Keizo; Mori, Hazime; Kobayashi, Takao; Kiuchi, Mitsuyuki; and Ogino, Yoshio, 3,821,509.

Kobayashi, Tamio: *See—*
Kawada, Toshio; Torama, Tadashi; and Kobayashi, Tamio, 3,821,807.

Kobayashi, Yoshikazu, to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.). Color synchronizing signal generating device. 3,821,788, Cl. 358-19.000.

Kobe Steel Limited: *See—*
Fukuzuka, Toshio; Murakami, Tsuyoshi; Urai, Masaaki; and Sakaguchi, Mitutoshi, 3,820,368.

Kobe Steel, Ltd.: *See—*
Sugano, Katsumi; Ikegami, Yoshio; and Kimura, Hirohumi, 3,821,511.

Kobelt, Jack R. Neutral time-delay fluid control circuit. 3,820,438, Cl. 91-36.000.

Kobori, Toshio, to Minolta Camera Kabushiki Kaisha. Camera having an electric shutter. 3,821,757, Cl. 354-5.000.

Kobo*a, Isamu; and Miki, Yukio, to Minolta Camera Kabushiki Kaisha. Motion picture camera. 3,820,883, Cl. 352-91.00s.

Koch, Friedrich-Karl; and Rahn, Oskar, to Peltzer & Ehlers. Variable stroke ejector mechanism. 3,820,376, Cl. 72-427.000.

Koch, Thomas C. Indoor combustion unit. 3,820,527, Cl. 126-137.000.

Kocubej, Israel. Combined radio receiver and tape cartridge player for automobiles. 3,821,489, Cl. 179-100.110.

Koenig, Horst; Metzger, Horst; and Reif, Werner, to Basf Aktiengesellschaft. γ-Methoxy-γ-carbanilino-α,ω-dicyanopentane. 3,821,277, Cl. 260-465.00d.

Kogyo Gijutsuin: *See—*
Hayashi, Yutaka; and Tarui, Yasuo, 3,821,776.

Kohl, Vance L.; and Utter, Robert P., to King-Seeley Thermos Co. Ice Making apparatus. 3,820,354, Cl. 62-354.000.

Kohler, Karl Albert, to Rheinstahl Aktiengesellschaft. Gun turret, especially for armored vehicles. 3,820,436, Cl. 89-36.00k.

Koller, Thomas J.: *See—*
Holland, William P.; and Koller, Thomas J., 3,821,581.

Komarov, German Vyacheslavovich: *See—*
Trostyanskaya, Elena Borisovna; Komarov, German Vyacheslavovich; and Tsarakhov, Jury Sergeevich, 3,821,054.

Kommanditbolaget United Stirling (Sweden) AB & Co.: *See—*
Hakansson, Sven Anders Samuel, 3,820,330.

Komoto, Fusae: *See—*
Kurono, Masayasu; Komoto, Fusae; Chiba, Takeshi; and Hayashi, Masaki, 3,821,279.

Koncos, Robert: *See—*
Taylor, Robert C.; Koncos, Robert; and Meyers, Joseph A., III, 3,821,067.

Konijn Machinebouw N.V.: *See—*
Konijn, Nicolaas Gerardus, 3,820,497.

Konijn, Nicolaas Gerardus, to Konijn Machinebouw N.V. Transport vehicle. 3,820,497, Cl. 115-1.00r.

Konsowski, Stephen G.: *See—*
Lindberg, Frank A.; Ponemone, Seymour J.; Konsowski, Stephen G.; and Shamash, Maurice B., 3,820,994.

Kopacsi, John, 20% to Lee, Raymond, Organization, Inc., The. Foot cast shoe type cover. 3,820,254, Cl. 36-2.50r.

Kopetschke, Alfred, to Wieland-Werke AG. Method for roll-forming of ribbed pipes. 3,820,371, Cl. 72-98.000.

Koppe, Volker; Schulte, Karl; Borck, Joachim; Poetsch, Eike; and Muller-Calgan, Helmut. Merck Patent Gesellschaft mit beschrankter Haftung 1-Pyrazolyl-alkyl-4-phenyl-3,4-dehydropiperidines. 3,821,234, Cl. 260-295.0am.

Koppers Company, Inc.: *See—*
Russell, Robert Jackson, 3,820,727.

Kormer, Vitaly Abramovich: *See—*
Jufa, Tatyana Lvovna; Poletaeva, Irina Alexandrovna; Kormer, Vitaly Abramovich; Babitsky, Boris Davydovich; Lobach, Mark Iosifovich; Markova, Viktoria Vladimirovna; and Churlyaeva, Lidia Alexandrovna, 3,821,181.

Kornrumpf, William P.; Walden, John P.; and Walker, Loren H., to General Electric Company. Commutation failure detection and control for SCR inverters. 3,821,630, Cl. 321-11.000.

Kornylak, Andrew T., to Kornylak Corporation. Hydraulic door hinge. 3,820,282, Cl. 49-255.000.

Kornylak Corporation: *See—*
Kornylak, Andrew T., 3,820,282.

Korshak, Vasily Vladimirovich; Andrianov, Kuzma Andrianovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Khananashvili, Lotary Mikhailovich; Vasilieva, Tatyana Vsevolodovna; Elerdashvili, Georgy Vasilievich; Gureeva, Galina Ilinichna; Kotov,Valery Mikhailovich; and Brontman, Rostislav Lazarevich. Heat-resistant antifriction polymeric material. 3,821,112, Cl. 252-12.400.

Kortenbach & Rauh Kommanditgesellschaft: *See—*
Wortmann, Franz Xaver, 3,820,489.

Kosano, Yoshiyasu; Nakajima, Shin; and Yagiu, Masaru, to Suntory Ltd. Preparation of alcoholic malt beverages. 3,821,418, Cl. 426-16.000.

Koski, Jerry V., to Parker-Hannifin Corporation. Hydraulically operated tube flaring tool. 3,820,375, Cl. 72-316.000.

Kosman, Karel Jan Williams; and Boivin, Louis-Philippe, to Northern Electric Company Limited. Encapsulated solid state light emitting device. 3,821,590, Cl. 313-499.000.

Kotov, Valery Mikhailovich: *See—*
Korshak, Vasily Vladimirovich; Andrianov, Kuzma Andrianovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Khananashvili, Lotary Mikhailovich; Vasilieva, Tatyana Vsevolodovna; Elerdashvili, Georgy Vasilievich; Gureeva, Galina Ilinichna; Kotov,Valery Mikhailovich; and Brontman, Rostislav Lazarevich, 3,821,112.

Kraftco Corporation: *See—*
Runge, Heinz F., 3,821,046.
Tabernacki, Harry A., 3,820,503.

Kraina, Jack H.: *See—*
Carlson, Robert D.; Kraina, Jack H.; and Wegner, Robert C., 3,820,629.

Kramer, Joseph R.: *See—*
Donohue, James M.; Kramer, Joseph R.; and Rouek, Victor, 3,820,893.

Krapcho, John; and Turk, Chester Frank, to Squibb, E. R., & Sons, Inc. Anti-inflammatory agents. 3,821,377, Cl. 424-246.000.

Krasnov, Alexandr Petrovich: *See—*
Korshak, Vasily Vladimirovich; Andrianov, Kuzma Andrianovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Khananashvili, Lotary Mikhailovich; Vasilieva, Tatyana Vsevolodovna; Elerdashvili, Georgy Vasilievich; Gureeva, Galina Ilinichna; Kotov,Valery Mikhailovich; and Brontman, Rostislav Lazarevich, 3,821,112.

Kraus, Charles E., to Excelermatic, Inc. Variable ratio rotary motion transmitting device. 3,820,416, Cl. 74-690.000.

Kraus, Erhard: *See—*
Stonner, Hans-Martin; and Kraus, Erhard, 3,820,954.

Kraus, Theodore C.; Scruggs, James A.; and Trotz, Sameul I., to Olin Mathieson Chemical Corporation. Preparation of non-solvated aluminum hydride. 3,821,360, Cl. 423-645.000.

Kraus, Werner: *See—*
Kraus, Werner; Lechner, Fritz; and Viehbach, Hans-Dieter, 3,820,534.

Kraus, Werner; Lechner, Fritz; and Viehbach, Hans-Dieter, to Kraus, Werner. Device for promoting the formation of bone substance. 3,820,534, Cl. 128-82.100.

Krauss-Maffei Aktiengesellschaft: *See—*
Schwarzler, Peter, 3,820,472.

Krautkramer-Branson Incorporated: *See—*
Grabendorfer, Werner; Gregor, Manfred; and Schlengermann, Udo, 3,820,387.

Kravitz, Lawrence C., to General Electric Company. Monolithic semiconductor display devices. 3,821,616, Cl. 357-29.000.

Kreh, Bernard: *See—*
Martuch, Leon L.; and Kreh, Bernard, 3,820,271.

Kress, Edward S.; Kress, Ralph H.; and Medley, Jackson C. Steering and suspension for high capacity vehicles. 3,820,818, Cl. 280-96.20r.

Kress, Ralph H.: *See—*
Kress, Edward S.; Kress, Ralph H.; and Medley, Jackson C., 3,820,818.

Kreuzer, Lloyd Barton, to Bell Telephone Laboratories, Incorporated. Measurement of concentrations of components of a gaseous mixture. 3,820,901, Cl. 356-97.000.

Krieter, Georg-Heinz: *See—*
Hartmann, Hans; Krieter, Georg-Heinz; and Mauthe, Gerhard, 3,821,687.

Krueger, Hans: *See—*
Greubel, Waldemar; Krueger, Hans; and Wolff, Ulrich, 3,821,720.

Kubotera, Haruo; Hashimoto, Yukio; Ohkubo, Masuta; Gonda, Hisashi; Tanaka, Nobuo; Matsudo, Kazuo; and Shimomura, Takayoshi, to Nippon Kokan Kabushiki Kaisha. Method for manufacturing cold rolled steel having excellent drawability. 3,821,031, Cl. 148-2.000.

Kuck, John H.; and Staake, Donal B., to United States of America, Navy. Frequency diversity pulse doppler radar. 3,821,736, Cl. 343-7.700.

Kudamatsu, Akio: *See—*

Kishino, Shigeo; Kudamatsu, Akio; Shiokawa, Kozo; and Yamaguchi, Shinich, 3,821,246.

Kuehl, Paul B., to General Motors Corporation. Exhaust gas recirculation control. 3,820,514, Cl. 123-119.00a.

Kuehnle, Manfred R., to Audac Corporation. Information storage and retrieval system. 3,820,890, Cl. 355-5.000.

Kuhnelt, Gert: *See*—
Plockinger, Erwin; and Kuhnelt, Gert, 3,820,587.

Kurakawa, Junji; and Soga, Setsuo, to Ricoh Co. Ltd. Electrophotographic copying method using a liquid developing agent capable of effecting both regular copying and inverse copying. 3,820,891, Cl. 355-10.000.

Kurio, Noriyuki: *See*—
Uchiyama, Yoshio; and Kurio, Noriyuki, 3,820,925.

Kurohara, Hiroyoshi: *See*—
Shiraishi, Hipoo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,820,353.

Kuroi Electric Industrial Company: *See*—
Kitamura, Masaharu; Murakami, Kiyohiko; and Watanabe, Hiromu, 3,821,542.

Kurono, Masayasu; Komoto, Fusae; Chiba, Takeshi; and Hayashi, Masaki, to Ono Pharmaceutical Co., Ltd. 4-Hydroxybutyl,6-hydroxyphexyl and 8-hydroxyoctyl prostaglandin esters. 3,821,279, Cl. 260-468.00d.

Kurtin, Stephen L., to Hughes Aircraft Company. Infrared photocathode. 3,821,778, Cl. 357-30.000.

Kurtz, Maurice K., Jr.: *See*—
Mikhail, Edward M.; Stevenson, Warren H.; Kurtz, Maurice K., Jr.; and Balasubramanian, N., 3,820,895.

Kus, Walter C. Tool bit. 3,820,211, Cl. 29-101.000.

Kusumoto, Koshi: *See*—
Mizutani, Yukio; Kusumoto, Koshi; and Mizumoto, Yosinori, 3,821,127.

Kuszewski, James R.; Luckenbaugh, Raymond W.; and Wayne, Winston J., to Du Pont de Nemours, E. I., and Company. 5-Chloro-6-methyl-3-neopentyluracil. 3,821,223, Cl. 260-260.000.

Kutz, John E. Pedal drive. 3,820,820, Cl. 280-252.000.

Kuzovkov, Alexandr Dmitrievich: *See*—
Zhdanovich, Jury Vasilievich; Lokshin, Galina Borisovna; Kuzovkov, Alexandr Dmitrievich; Rudaya, Sarra Markovna; and Solovieva, Nadezhda Konstantinovna, 3,821,085.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Yamamoto, Atsushi; and Ohta, Shigenori, 3,821,126.

Kyu, Shikun: *See*—
Kase, Kiyoshi; and Kyu, Shikun, 3,821,650.

La Force, Robert C. Semi-buoyant sinker. 3,820,270, Cl. 43-43.140.

La Tourette assor. to said: *See*—
La Tourette, Charles; and Mullen, Patrick E., 3,820,655.

La Tourette, Charles; and Mullen, Patrick E. (said La Tourette assor. to said), to Consolidated/Eureka Paperbox, Inc. and said Mullen assor. to said Rx-Pack Company. Article holding and dispensing container. 3,820,655, Cl. 206-42.000.

Lacefield, William B., to Lilly, Eli, and Company. 3,5-Diacyloxybenzoic acids used as anti-inflammatory agents. 3,821,401, Cl. 424-308.000.

Lacour, Bernard: *See*—
Godard, Bruno; Yvette, Gif Sur; and Lacour, Bernard, 3,821,664.

Ladine, Duane A., to Enviro-Labs, Inc. Method of reading punched tape and apparatus for same. 3,821,520, Cl. 235-61.11e.

LaGrouw, Coenraad Maria, to U.S. Philips Corporation. NiO and CoO containing glass for television display cathode-ray tubes. 3,821,004, Cl. 106-52.000.

Lai, San-Cheng, to Kerr-McGee Chemical Corporation. Process for electrodepositing manganese metal. 3,821,096, Cl. 204-105.00m.

Lai-Hing, Courtney: *See*—
Carey, Peter Majendie; and Lai-Hing, Courtney, 3,821,730.

Lambert, Vernon L.: *See*—
Wakefield, Shirley L.; and Lambert, Vernon L., 3,821,040.

Lamberti, Vincent, to Lever Brothers Company. Detergent compositions containing slats of 4-hydroxyalkanoic acids. 3,821,115, Cl. 252-89.000.

Lambo, Claude, to APA Manufactories N. V. Device for warming aquarium water. 3,821,514, Cl. 219-296.000.

Lamm, Heinz, to Daimler-Benz A.G. Sealing bar for a rotary piston internal combustion engine. 3,820,798, Cl. 277-81.00p.

Lamm, William R.; Davis, Larry G.; and Dworschack, Robert G., to Standard Brands Incorporated. Treating cells of microorganisms containing intracellular glucose isomerase. 3,821,082, Cl. 195-31.00f.

Lampart: *See*—
Sarlos, Agoston, 3,820,410.

Lampson, Sidney B.: *See*—
MacDonald, Ira A.; Egan, Richard R.; and Lampson, Sidney B., 3,821,442.

Lanchikov, Konstantin Vasilievich: *See*—
Agushev, Vladimir Alexandrovich; Brusilovsky, Iosif Veniaminovich; Gamajunov, Alexandr Mikhailovich; Lanchikov, Konstantin Vasilievich; Sosner, Jury Moiseevich; Tsodikov, Veniamin Yakovlevich; and Judochkin, Sergei Sergeevich, 3,820,916.

Land, Edwin H.; Bloom, Stanley M.; and Farney, Leonard C., to Polaroid Corporation. Silver image stabilization with noble metal compounds and enediol developers. 3,821,000, Cl. 96-76.00r.

Lander, Jack Robert, to Electro-Module, Inc. Thermally conductive mounting means. 3,820,592, Cl. 165-47.000.

Landis Tool Company mesne: *See*—
Gebel, Kurt M., 3,820,443.

Lang, L. F., & Son Pools, Inc.: *See*—
Lang, Robert S.; and Carnot, Robert L., 3,820,552.

Lang, Robert S.; and Carnot, Robert L., to Lang, L. F., & Son Pools, Inc. Filter Cartridge cleaner. 3,820,552, Cl. 134-113.000.

Langan, James. Shield for hypodermic syringe. 3,820,541, Cl. 128-215.000.

Lange, Emroy W.: *See*—
Matsko, Joseph J.; Hill, Robert H.; and Lange, Emroy W., 3,821,607.

Lange, Ralf: *See*—
Vernaleken, Hugo; Lange, Ralf; Schnell, Hermann; and Schwarz, Hans-Helmut, 3,821,294.

Langlie, Howard: *See*—
Berg, Albert T., Jr.; and Langlie, Howard, 3,820,758.

Lanier Electronic Laboratory, Inc., mesne: *See*—
Nye, William M.; and Jones, Stanley W., 3,821,802.

Lanphere, Gerald B.: *See*—
Hesslein, Robert J.; Chamberlin, Robert W.; and Lanphere, Gerald B., 3,820,668.

Lansing Bagnall Limited: *See*—
Goodacre, Cecil; and Leggett, Peter Alfred, 3,820,674.

Lanzillotta, Tony, to Lee, Raymond, Organization, Inc., The. Hair dryer and groomer. 3,820,551, Cl. 132-11.000.

Lapham, Sidney D. Self-tracking industrial trailer. 3,820,811, Cl. 280-99.000.

Lapin, Jury Emanuilovich: *See*—
Rivin, Evgeny Izrailevich; and Lapin, Jury Emanuilovich, 3,820,422.

Larker, Hans; and Nilsson, Jan, to Allmanna Svenska Elektriska Aktiebolaget. Method of joining wire of compound material. 3,820,229, Cl. 29-470.100.

Larsen, Holger: *See*—
Parker, Wilbur Allen; Bordt, Guillermo German; and Larsen, Holger, 3,821,448.

Larsile, Jacques, to Technilec. Wall service ducts. 3,821,688, Cl. 339-22.00r.

Larson, Daniel A., to Westinghouse Electric Corporation. High pressure mercury-titanium iodide discharge lamp with phosphor coating. 3,821,576, Cl. 313-25.000.

Larson, Daniel A., to Westinghouse Electric Corporation. High pressure mercury chromium iodide discharge lamp with phosphor coating. 3,821,577, Cl. 313-25.000.

Larson, Wesley S., to Water Control Products Inc. Fluid control mechanism. 3,820,171, Cl. 4-31.000.

Larsson, Sven Gunnar Olof, to Gunnebo Bruks Aktiebolag. Cartridge case ejector for bolt gun. 3,820,266, Cl. 42-25.000.

Lasky, Mervyn C. Removable dental bridge and method for making same. 3,820,241, Cl. 32-5.000.

Lasoff, Murray; Baldwin, Raymond C.; and Natanblut, Herman B., to Burroughs Corporation. Digital data refreshing apparatus for radar display system. 3,821,735, Cl. 343-5.0dp.

Lattarulo, Charles Joseph; and Civardi, Frank Peter, to Inmont Corporation. Microporous water-vapor permeable sheet material carrying closely spaced raised polymer deposits. 3,821,012, Cl. 117-45.000.

Lauchlan, Robert L.; and Snodgrass, Hugh E., to Uniroyal, Inc. Polycarbonate-vinylidene fluoride hexafluoropropylene copolymer blend. 3,821,326, Cl. 260-873.000.

Laurel Color, Inc.: *See*—
Hayes, David F.; and Roth, Stanley M., 3,821,516.

Laurent, Daniel, to Societe Dauphinoise Electrique. Polyphase collector head assembly having inner partition walls. 3,821,497, Cl. 191-57.000.

Lauro, Gene F.: *See*—
Tidball, Robert A.; and Lauro, Gene F., 3,820,333.

Lavigne, Joe B., to Chevron Research Company. Polycarboxylic acid compositions. 3,821,258, Cl. 260-346.800.

Lavrinovich, Edvard Stanislavovich; Germane, Skaidrite Karlovna; Treigute, Ilze Edgarovna; and Matisovich, Gunar. Method for preparation of N-substituted 4-aniline piperidines. 3,821,231, Cl. 260-293.790.

Lay, Henry G.: *See*—
Buzalski, Bruce T.; Chauvin, Bernard; and Lay, Henry G., 3,820,940.

Layden, George K., to United Aircraft Corporation. Densification of silicone nitride. 3,821,005, Cl. 106-55.000.

Layton, Gary Richard: *See*—
Culhane, Gerald John; Layton, Gary Richard; and Pittman, Walter Elwood, 3,821,002.

Le Nickel: *See*—
Gandon, Louis; and Goulaouic, Marie, 3,821,354.

Lear Avia Corporation: *See*—
Tippetts, Earl Levell, 3,821,698.

Lechner, Fritz: *See*—
Kraus, Werner; Lechner, Fritz; and Viehbach, Hans-Dieter, 3,820,534.

Leclercq, Alain: *See*—
Alberny, Robert; and Leclercq, Alain, 3,820,584.

Lee, Bong Kuk; Ryu, Dewey D. Y.; and Pansy, Felix Edward, to Squibb, E. R., & Sons, Inc. Derivatives of 6-amino penicillanic acid. 3,821,198, Cl. 260-239.100.

Lee, Chin K.; and Long, Margaret E., to Reynolds, R. J., Tobacco Company. Enzymatic process using immobilized microbial cells. 3,821,086, Cl. 195-116.000.

Lee, Raymond, Organization, Inc., The: *See—*
Abernathy, Harlan O., 3,820,251.
Hughes, Jack Thomas, 3,820,912.
Kopacsi, John, 3,820,254.
Lanzillotta, Tony, 3,820,551.
Molatalab, Hossien, 3,820,839.
Molatalab, Hossien, 8,320,839.
Stone, John F., 3,820,184.

Lee, Samuel: *See—*
Dellian, Kurt A.; Weiskopf, Marvin; and Lee, Samuel, 3,820,952.

Leemann, Karl. Reserve valve mechanism permitting refilling of scuba tank regardless of valve setting. 3,820,560, Cl. 137-493.400.

LeFebvre, Clarence A.: *See—*
Cutforth, Howard G.; LeFebvre, Clarence A.; and Steinle, Melvin E., 3,821,042.

Leger, Andre: *See—*
Fouche, Jean; and Leger, Andre, 3,821,197.

Leggett, Peter Alfred: *See—*
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Leheny, Robert Francis: *See—*
DeWinter, John Christian; Leheny, Robert Francis; Nahory, Robert Edward; Shah, Jagdeep Chandravadan; and Shaklee, Kerry Lee, 3,821,662.

Lehmann, Helmut: *See—*
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weib, Gunter, 3,821,047.

Leinen, Roger W.: *See—*
Fairbanks, Charles W.; and Leinen, Roger W., 3,821,055.

Leitner, Erwin M. Automotive anti-theft device. 3,820,361, Cl. 70-241.000.

Lekhtman, Moisei Abramovich: *See—*
Andreev, Oleg Semenovich; Birjukov, Boris Konstantinovich; Byzov, Yury Mikhailovich; Lekhtman, Moisei Abramovich; Perelberg, Azik Iosifovich; Strimbling, Semen Itskhovich; Trachevsky, Boris Sergeevich; Fikhman, Isak Berovich; Cherepakha, Pavel Andreevich; nd Shraifeld, Tamara Yakovlevna, 3,821,749.

Lektromedia Ltd.: *See—*
Carey, Peter Majendie; and Lai-Hing, Courtney, 3,821,730.

Leland, Chester W., to Leland Engineering, Inc. Removable fifth wheel hitch. 3,820,821, Cl. 280-423.00r.

Leland Engineering, Inc.: *See—*
Leland, Chester W., 3,820,821.

Lemelson, Jerome H. Control system for molding. 3,820,928, Cl. 425-146.000.

Lenfant, Rene, to Compagnie Generale d'Electricite. Retro-reflector. 3,820,872, Cl. 350-102.000.

Lennon, William T., Jr.: *See—*
Chisholm, John P.; Lennon, William T., Jr.; Doane, James R.; and Maslow, Frank Z., 3,821,523.

Lenz, Arnold: *See—*
Dittrich, Werner; and Lenz, Arnold, 3,821,003.

Leonard, Guy W.; and Ross, Hubert M., Jr., to United States of America, Navy. Shotgun grenade. 3,820,463, Cl. 102-38.000.

Leonard, Thomas R.; and Birkenshaw, James R. Tree watering stand. 3,820,749, Cl. 248-44.000.

Leonard, Ulysses. Animated display. 3,820,265, Cl. 40-106.300.

Lerner, Martin L.; and Maskell, Roy, to Zenith Radio Corporation. Method of aluminizing a cathode-ray tube screen. 3,821,009, Cl. 117-33.5cm.

Leuck, Donald D., to Owens-Illinois, Inc. Sustainer voltage generator. 3,821,596, Cl. 315-169.0tv.

Levasseur, Joseph L., to H. R. Electronics Company. Vend control circuit with improved deposit refund and accumulation means. 3,820,642, Cl. 194-1.00n.

Levchenko, Boris Leonidovich: *See—*
Chernyshev, Petr Sergeevich; Spiridonov, Konstantin Alexeevich; Pakhomov, Vladimir Alexandrovich; Nikolaev, Georgy Vasilievich; Volfson, Izrail Mordukhovich; Levchenko, Bo.is Leonidovich; Ryzhkov, Viktor Kuzmich; Gladkovsky, Petr Stanislavovich; Shargorodsy, Viktor Semenovich; and Shlyapin, Alexandr Nikolaevich, 3,820,915.

Lever Brothers Company: *See—*
Begemann, Willem Johan; and Harkes, Pieter Daniel, 3,821,421.
Blake, Anthony; and Pendlington, Sidney, 3,821,435.
Gould, Grahame Warwick, 3,821,424.
Lamberti, Vincent, 3,821,115.

Levier, Robert R.: *See—*
Bennett, Donald R.; and Levier, Robert R., 3,821,373.

Levine, Michael Robert, to Ann Arbor Terminals, Inc. Graphics display system and method. 3,821,731, Cl. 340-324.0ad.

Levy, Alfred W. Detachable plastic shipping bags. 3,820,651, Cl. 206-390.000.

Lewis, Alan G., to GAF Corporation. Tone arm automatic reset mechanism for an audio-visual device. 3,820,887, Cl. 353-120.000.

Lewis, Edward T., to Sperry Rand Corporation. Piezoresistive bridge transducer. 3,820,401, Cl. 73-398.0ar.

Lewis, Eugene C.; Gottlieb, C. Robert; and Macy, Robert H. Apparatus for transporting factory constructed housing units. 3,820,664, Cl. 214-14.000.

Lewis Industries, Inc.: *See—*
Gottlieb, Robert G., 3,821,694.

Lewis, James M.; and Wainer, Eugene, to Horizons Incorporated; a division of Horizons Research and Horizons Research Incorporated. Light sensitive reproduction and electron beam sensitive material. 3,820,993, Cl. 96-35.100.

Lewis, Joseph Earle, Jr.; and Roberts, George Leathwhite, Jr., to American Cyanamid Company. Titanium dioxide pigments. 3,821,359, Cl. 423-610.000.

Lewis, Morton, to Swift & Company. Flame retardant halogen and phosphorus containing polyols. 3,821,263, Cl. 260-403.000.

Lewis, Morton, to Swift & Company. Amino methyl phosphonates. 3,821,335, Cl. 260-945.000.

Liberman, Irving; Zollweg, Robert J.; and Burnham, Walter J., to Westinghouse Electric Corporation. Ceramic discharge lamp operable in air without an outer glass envelope. 3,821,587, Cl. 313-217.000.

Licencia Talalmanyokat Ertekesito Vallalat: *See—*
Balint, Istvan; and Baumann, Sandor, 3,820,625.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Steiner, Karl, 3,821,583.

Licentia-Patent-Verwaltungs-G.m.b.H.: *See—*
Herl, Hans; Hurlebaus, Klaus; and Sauer, Fritz, 3,820,483.

Lieberman, Irving, to Whittier Corporation. Explosive forging of external surfaces. 3,820,222, Cl. 29-401.000.

Ligon, Elmer R.; and Friley, Paul B., to Dickey, W. S., Clay Manufacturing Company. Fitting structure for pipe. 3,820,826, Cl. 285-55.000.

Liljekvist, Bernt Soren: *See—*
Lundstrom, Hans Per Olof; and Liljekvist, Bernt Soren, 3,820,849.

Lillian Lloyd: *See—*
Francis, Robert Hugh, 3,820,745.

Lilly, Eli, and Company: *See—*
Lacefield, William B., 3,821,401.

Limpach, Paul D., to Gendron-Diemer, Inc. Hydraulic system for wheeled stretchers. 3,820,838, Cl. 296-20.000.

Limque, Ferdinand; Bertrand, Hans; and Bielefeldt, Irvin P., to Ipsen Industries International Gesellschaft mit beschrankter Haftung. Vacuum furnace. 3,820,766, Cl. 266-4.00a.

Lin, Kang, to Du Pont de Nemours, E. I., and Company. Triazinones. 3,821,219, Cl. 260-248.0ns.

Lin, Ruey Y.; Murty, Hari N.; and Pietrantuone, Anthony J., to Carborundum Company, The. Paper from pitch based organic fibers. 3,821,074, Cl. 162-146.000.

Lincoln, Frank H., Jr.; and Pike, John E., to Upjohn Company, The. 5,6-Trans PGB_2. 3,821,291, Cl. 260-514.00d.

Lincoln, Lewis L.; and Heseltine, Donald W., to Eastman Kodak Company. Rigidized carbocyanine dyes containing a pyrido dipyridinium nucleus. 3,821,233, Cl. 260-294.80a.

Lincoln Manufacturing Company, Inc.: *See—*
Joeckel, Stanley V., 3,821,502.

Lindberg, Allan W., to Emerson Electric Co. Electric induction motor and control system. 3,821,620, Cl. 318-227.000.

Lindberg, Frank A.; Ponemone, Seymour J.; Konsowski, Stephen G.; and Shamash, Maurice B., to Westinghouse Electric Corporation. Penetration of polyimide films. 3,820,994, Cl. 96-36.000.

Lindblom, Georg; and Olsson, Karl-Erik, to Allmanna Svenska Elektriska Aktiebolaget. Control circuit for a thyristor. 3,821,564, Cl. 307-252.00h.

Linde, Bjorn H:son: *See—*
Martensson, Kjell Halvard; Linde, Bjorn H:son; Palsson, Jan Frederik; and Jerre, Sven Torsten, 3,820,303.

Lindgren, Hans Boris. Apparatus for applying liquids to the surface of bodies. 3,820,904, Cl. 401-6.000.

Lindler, James Monroe, to Columbia Products Company. Collet assembly. 3,820,801, Cl. 279-48.000.

Linguenheld, Louis: *See—*
Dumoulin, Jean; and Linguenheld, Louis, 3,821,154.

Linke, Dietrich: *See—*
Reinecke, Gunter; and Linke, Dietrich, 3,820,300.

Linkous, Clovis E., to General Electric Company. Thermally protectable multispeed motor. 3,821,602, Cl. 317-13.00b.

Lipe Rollway Corporation: *See—*
Hesslein, Robert J.; Chamberlin, Robert W.; and Lanphere, Gerald B., 3,820,668.

Lippke, Paul; deceased (by Hiemke, Rudolph). Device for checking movable webs of paper, synthetic material, metal foils, and the like. 3,821,557, Cl. 250-572.000.

Lipscomb, Charles A., Jr.; and Smith, Treva M., to United States of America, Navy. Process for promoting an oxide for use in a pyrotechnic composition. 3,821,120, Cl. 252-186.000.

Lishevskaya, Marina Osipovna; Virnik, Alexandr Davidovich; Gabrielian, Genrikh Aramaisovich; Rogovin, Zakhar Alexandrovich; Borbat, Vladimir Fedorovich; Orlov, Alexandr Mikhailovich; Ferberg, Mirriam Borisovna; and Markelova, Nina Ivanovna. Graft copolymer of cellulose and polyacrylthioamide method of their production and application. 3,821,137, Cl. 260-17.4gc.

Liss, Gote, to Allmanna Svenska Elektriska Aktiebolaget. Converter station with parallel static converters. 3,821,629, Cl. 321-11.000.

Lister, John W., to General Electric Company. Circuit for driving quadripole convergence. 3,821,591, Cl. 315-13.00c.

Litteral, Carl J.: *See—*
Walsh, John J.; and Litteral, Carl J., 3,821,122.

Little, Arthur D., Inc.: *See—*
Arciprete, Genio R.; and Martin, Peter G., 3,821,710.

Little, Harvey G.: *See—*
Daugherty, Hiram G.; and Little, Harvey G., 3,821,220.

Littman, Bernard; and Friedmann, Paul Garson. On-line adaptive control of a heat exchanger. 3,820,590, Cl. 165-26.000.

Litton Industrial Products, Inc.: *See—*
Betke, Adolf C., 3,821,631.

Litton Systems, Inc.: *See—*
Erickson, Fred W.; and Price, John G., 3,821,727.

Lizotte, Robert H.: *See—*
Klar, John; and Lizotte, Robert H., 3,820,287.

Llewelyn, David Myers, to International Nickel Company, Inc., The. Carbonyl nickel powder. 3,820,977, Cl. 75-.5aa.

Lobach, Mark Iosifovich: *See—*
Jufa, Tatyana Lvovna; Poletaeva, Irina Alexandrovna; Kormer, Vitaly Abramovich; Babitsky, Boris Davydovich; Lobach, Mark Iosifovich; Markova, Viktoria Vladimirovna; and Churlyaeva, Lidia Alexandrovna, 3,821,181.

Lobel, Leon: *See—*
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Lobel, Stanley, 1/2 to Lobel, Leon. Method of ageing meat. 3,821,454, Cl. 426-524.000.

Lockheed Aircraft Corporation: *See—*
Wirt, Leslie S., 3,820,627.

Loev, Bernard, to Smithkline Corporation. Pharmaceutical compositions and methods of inhibiting gastric acid secretion. 3,821,386, Cl. 424-263.000.

Lohse, Friedrich; Schmid, Rolf; and Batzer, Hans, to Ciba-Geigy Corporation. Thermosetting mixtures of polyisocyanates, weakly branched polyesters and polyoles. 3,821,165, Cl. 260-47.0cb.

Lokshin, Galina Borisovna: *See—*
Zhdanovich, Jury Vasilievich; Lokshin, Galina Borisovna; Kuzovkov, Alexandr Dmitrievich; Rudaya, Sarra Markovna; and Solovieva, Nadezhda Konstantinovna, 3,821,085.

Lombardi, Mario, to Olivetti, Ing. C., & C., S.p.A. Programmed vertical tubulating device for typewriter. 3,820,646, Cl. 197-114.00r.

Long, Alan C.: *See—*
Cowley, Brian Richard; Gregory, Gordon I.; and Long, Alan C., 3,821,206.

Long, Ivan A.; and Long, Richard L. Lower limb prosthesis. 3,820,169, Cl. 3-22.000.

Long, Margaret E.: *See—*
Lee, Chin K.; and Long, Margaret E., 3,821,086.

Long, Richard L.: *See—*
Long, Ivan A.; and Long, Richard L., 3,820,169.

Longo, Isadore S.; and Watson, James J., 1/2 to CP Auto Products; division of Custom Plating Corporation and Rocket Racing Products. Wheel adaptor. 3,820,851, Cl. 301-9.0dn.

Longstaff-Tyrrell, John, to Lucas, Joseph, (Industries) Limited. Vehicle ignitions systems. 3,820,521, Cl. 123-148.00e.

Looger, Lonnie L.: *See—*
Strickland, Raymond I.; and Looger, Lonnie L., 3,820,751.

Loos, John C., to United States of America, Navy. Method for world wide synchronization of tracking radars. 3,821,751, Cl. 343-5.00r.

Lopke, Edward L.: *See—*
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Loral Corporation: *See—*
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L'Oreal: *See—*
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Lortscher, Hans-Peter: *See—*
Steffen, Jurg; and Lortscher, Hans-Peter, 3,821,661.

Los, Marinus, to American Cyanamid Company. Disubstituted naphthalenone compounds. 3,821,308, Cl. 260-586.00f.

Louis, Gerard Alexis. Speed variators. 3,820,408, Cl. 74-200.000.

Love, L. S., & Associates Limited: *See—*
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Low, Arnold Edward: *See—*
Harrington, Richard John; Low, Arnold Edward; and Sturtevant,, 3,821,485.

Lubrizol Corporation, The: *See—*
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Lucas, Joseph, (Industries) Limited: *See—*
Burrage, Robert Graham, 3,820,321.
Grindley, William; Bunn, George Edward; Ormerod, Alan; and Harrison, Alwin, 3,820,324.
Longstaff-Tyrrell, John, 3,820,521.

Luciano Ciampi: *See—*
Scarpa, Orlando, 3,820,204.

Lucid, Michael Francis, to Kerr-McGee Corporation. Solvent extraction of metal ions using N-substituted hydroxamic acids. 3,821,351, Cl. 423-9.000.

Luckenbaugh, Raymond W.: *See—*
Kuszewski, James R.; Luckenbaugh, Raymond W.; and Wayne, Winston J., 3,821,223.

Ludwig, Carl H., to Bendix Corporation, The. Capacitance to frequency transducer. 3,821,659, Cl. 331-65.000.

Ludwig, Howard C., to Westinghouse Electric Corporation. Liquid metal current-limiting device. 3,821,680, Cl. 337-114.000.

Luetzelschwab, Wayne E., to Marathon Oil Company. Sour water purification process. 3,821,110, Cl. 210-63.000.

Luiten, Willem: *See—*
Westendorp, Frans Frederik; Luiten, Willem; and De Kort, Gijsbertus Maria Arnolds Josephus, 3,821,034.

Lundberg, Anders: *See—*
Brandin, Tore; and Lundberg, Anders, 3,820,350.

Lundberg, Robert D.: *See—*
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Makowski, Henry S.; and Lundberg, Robert D., 3,821,149.

Lundqvist, Karl Gunnar: *See—*
Granbom, Bo; and Lundqvist, Karl Gunnar, 3,820,446.

Lundstrom, Hans Per Olof; and Liljekvist, Bernt Soren, to Sandvik Aktiebolag. Cutting tips removably secured in milling cutter head. 3,820,849, Cl. 299-93.000.

Luque, Rafael Fernandez, to Shell Oil Company. Artificial seaweed cut from continuous band. 3,820,339, Cl. 61-3.000.

Lyckstedt, Bertil: *See—*
Johansson, Arne; and Lyckstedt, Bertil, 3,821,608.

Lyden, Frank J., to Oil-Rite Corporation. Liquid level gauge. 3,820,397, Cl. 73-328.000.

Lyon, John Jeffrey: *See—*
Katagi, Kazuo; Ross, Walter Lee; and Lyon, John Jeffrey, 3,821,728.

M&T Chemicals Inc.: *See—*
Harbulak, Edward Paul, 3,821,095.

Macalalad, Fidel Vallaluna: *See—*
Chittenden, Richard Marion; Whitton, Aldean William; Macalalad, Fidel Vallaluna; Massman, Richard; and Wilson, Earl David, 3,820,546.

MacDonald, Ira A.; Egan, Richard R.; and Lampson, Sidney B., to Ashland Oil, Inc. Emulsifier for frozen confections. 3,821,442, Cl. 426-356.000.

Macher, Karl, to Schneider, Jos., & Co. Optische Werke. High-speed varifocal objective system. 3,820,876, Cl. 350-184.000.

Machida, Shunichi; Tsujita, Masaharu; Nakaya, Shintaro; and Ueno, Ryoji, to Ebara Manufacturing Co., Ltd. Multiple effect evaporator apparatus. 3,820,581, Cl. 159-13.00a.

Machlett Laboratories, Incorporated, The: *See—*
Holland, William P.; and Koller, Thomas J., 3,821,581.

Macy, Robert H.: *See—*
Lewis, Eugene C.; Gottlieb, C. Robert; and Macy, Robert H., 3,820,664.

Madden, John W.: *See—*
Jonathan, Isaac; and Madden, John W., 3,821,538.

Madland, Robert C.: *See—*
Kallage, Richard G., Jr.; and Madland, Robert C., 3,821,529.

Maeda, Akitoshi: *See—*
Irikura, Tsutomu; Higo, Kyoichi; Maeda, Akitoshi; Morinaga, Fumihiko; and Naruke, Takeshi, 3,821,378.

Maeda, Ayahiko: *See—*
Tomita, Tsutomu; Mizukoshi, Masahiko; Ogiwara, Shinichi; and Maeda, Ayahiko, 3,821,441.

Maertin, Klaus Paul. Flotation sleeves. 3,820,179, Cl. 9-344.000.

Magenau, Horst: *See—*
Ziener, Hermann; Weber, Lothar; Jahnke, Horst; Magenau, Horst; and Zimmermann, Georg, 3,821,028.

Magnavox Company, The: *See—*
Durbin, Jesse, Jr.; and D'Aiuto, John Ralph, 3,821,789.
Perry, Clifton C., 3,821,790.

Magosch, Karl-Heinz: *See—*
Ruter, Jorn; Magosch, Karl-Heinz; Rombusch, Konrad; and Eichers, Ursula, 3,821,184.

Magoteaux, Orville R., to Allied Mineral Products, Inc. Charge additive composition to control electrical induction furnace lining wear. 3,820,978, Cl. 75-95.000.

Maher, William A. Steam propulsión system. 3,820,335, Cl. 60-670.000.

Mahler, Richard A. Evaporative coolant heat sink. 3,820,352, Cl. 62-293.000.

Maier, Elmar, to Hilti Aktiengesellschaft. Device for fastening intermediary plates on a mold wall. 3,820,702, Cl. 227-9.000.

Maki, Naoki; and Okuda, Hironori, to Hitachi, Ltd. Magnetic levitating and propelling device including split stabilizing coil for high speed train. 3,820,471, Cl. 104-148.0ss.

Makowski, Henry S.; and Lundberg, Robert D., to Esso Research and Engineering Company. Plasticized thermoplastic block copolymers. 3,821,148, Cl. 260-30.60r.

Makowski, Henry S.; and Lundberg, Robert D., to Esso Research and Engineering Company. Plasticized thermoplastic semicrystalline block copolymers. 3,821,149, Cl. 260-30.60r.

Malaboeuf, Michel E.: *See—*
Bolusset, Christian S.; Treheux, Michel E.; Alard, Francis R.; and Malaboeuf, Michel E., 3,820,869.

Malen, Charles; and Desnoyers, Pierre, to Science Union et Cie and Societe Francaise de Recherche Medicale. Thiazolyl benzoic acid compounds. 3,821,237, Cl. 260-302.00r.

Malen, Charles; Danree, Bernard; and Poignant, Jean-Claude, to Science-Union et Cie and Societe Francaise de Recherche Medicale. Dibenzothiazepin derivatives. 3,821,249, Cl. 260-327.00b.

Malles, Raymond W. Safety bottle device. 3,820,675, Cl. 215-9.000.

Mallory, P. R., & Co., Inc.: *See—*
Erwin, Robert Dale, 3,821,567.
Homan, William N.; and Stafford, Richard W., 3,821,503.

Malone, De Troy. Electrical conductor adjusting means for medical diagnostic equipment. 3,821,496, Cl. 191-12.20r.

Maltese, John, to E. R. C. Laboratory, Inc. Recorder-reproducer with solenoid-controlled record and rewind operations. 3,821,800, Cl. 360-62.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Reuchlein, Gunter, 3,820,331.

Manassen, Joost, to Yeda Research & Development Company. Process for the production of metals. 3,820,979, Cl. 75-108.000.

Mancy, Denise; Ninet, Leon; and Preud'Homme, Jean, to Rhone-Poulenc S.A. Antibiotic 19,402 R.P. 3,821,366, Cl. 424-117.000.

Mandel, Lewis R., to Merck & Co. Inc. Method of treatment. 3,821,381, Cl. 424-251.000.

Mandel, Lewis R., to Merck & Co., Inc. Method of treatment. 3,821,409, Cl. 424-332.000.

Mandy, Zolian: *See*—
Styron, James S.; and Mandy, Zolian, 3,820,349.

Manjikian, Serop. Reverse osmosis or ultrafiltration module. 3,821,108, Cl. 210-23.000.

Manley, Patrick J.: *See*—
Acerra, Roger J.; Manley, Patrick J.; and Shramovich, John W., 3,820,283.

Mannesmann-Meer Aktiengesellschaft: *See*—
Hiersig, Heinz M.; and Campbell, George T. R., 3,820,338.
Jansen, Herbert, 3,820,378.

Manning, Robert E.: *See*—
Anderson, Paul L.; and Manning, Robert E., 3,821,380.

Manoussos, Georges: *See*—
Kalopissis, Gregoire; and Manoussos, Georges, 3,821,405.

Mansfield, John William Brian, to Fleet Electronics Limited. Determination or monitoring of the distances of surfaces from reference positions. 3,821,558, Cl. 250-577.000.

Mansky, Michael: *See*—
Reeves, Robert C.; Mansky, Michael; Stavropoulos, Napoleon; Kaleda, William W.; and Richards, William J., 3,821,430.

Mansmann, Manfred; and Winter, Gerhard, to Bayer Aktiengesellschaft. Producing novel silicon dioxide fibers. 3,821,070, Cl. 161-172.000.

Mansson, Ragnar; Nilsson, Lars; Noberius, Leif; and Sundqvist, Cnut, to Aktiebolaget Asea-Atom. Steam separating means for boiling water reactors. 3,821,078, Cl. 176-54.000.

Mao, Chung-Ling; Bakker, Lynn A.; and Robertson, John R., to Uniroyal, Inc. Polyurethane foams and method of making same. 3,821,132, Cl. 260-2.5am.

Marathon Oil Company: *See*—
Gotshall, William W., 3,820,724.
Luetzelschwab, Wayne E., 3,821,110.

Marc Manufacturing Inc.: *See*—
Newman, Barry G., 3,821,500.

Marco, John L. Intrauterine device. 3,820,535, Cl. 128-130.000.

Marcum, Alfred L., Jr.: *See*—
Springer, Lamar D.; Mullendore, David L.; and Marcum, Alfred L., Jr., 3,820,729.

Margetts, George Philip: *See*—
Margetts, John L.; and Margetts, George Philip, 3,820,833.

Margetts, John L.; and Margetts, George Philip. Laterally extensible bumper for a camper body. 3,820,833, Cl. 293-63.000.

Mark, Victor; and Zengierski, Leon R., to Hooker Chemical Corporation. Aralkylation of aromatic hydrocarbons. 3,821,320, Cl. 260-649.00r.

Markelova, Nina Ivanovna: *See*—
Lishevskaya, Marina Osipovna; Virnik, Alexandr Davidovich; Gabrielian, Genrikh Aramaisovich; Rogovin, Zakhar Alexandrovich; Borbat, Vladimir Fedorovich; Orlov, Alexandr Mikhailovich; Ferberg, Mirriam Borisovna; and Markelova, Nina Ivanovna, 3,821,137.

Markisz, John A.: *See*—
Seewagen, George L.; and Markisz, John A., 3,820,836.

Markova, Viktoria Vladimirovna: *See*—
Jufa, Tatyana Lvovna; Poletaeva, Irina Alexandrovna; Kormer, Vitaly Abramovich; Babitsky, Boris Davydovich; Lobach, Mark Iosifovich; Markova, Viktoria Vladimirovna; and Churlyaeva, Lidia Alexandrovna, 3,821,181.

Marks, Helmuth, 1/2 to Fischer, Wilhelm. Method and apparatus for sealing pipe sections. 3,821,340, Cl. 264-45.000.

Marola, Americo E.; and Gehrke, Gerard W., to Torrington Company, The. Unidirectional clutch. 3,820,640, Cl. 192-45.000.

Marrs, Oren L.: *See*—
Campbell, Robert W.; and Marrs, Oren L., 3,821,072.

Marsello, Bernard D.; and Matthews, Lindsey T., to Monsanto Company. Electromagnetically resettable defect detecting sensor means for deactivating mechanically operable sensor switch. 3,821,499, Cl. 200-61.130.

Marshall, Robert Howard; and Wallace, Gary Leonard, to Chemetron Corporation. Method and apparatus for producing weight controlled groups of sliced food product. 3,820,428, Cl. 83-38.000.

Marsico, Joseph William, Jr.; Tomcufcik, Andrew Stephen; and Goldman, Leon, to American Cyanamid Company. Compositions of sulfonium ylides and method of use. 3,821,408, Cl. 424-331.000.

Martensson, Kjell Halvard; Linde, Bjorn H:son; Palsson, Jan Frederik; and Jerre, Sven Torsten, to Tetra Pak International AB. Packaging machine. 3,820,303, Cl. 53-186.000.

Martin, Donald L., to General Electric Company. Sintered cobalt-neodymium-samarium intermetallic product and permanent magnets produced therefrom. 3,821,035, Cl. 148-31.570.

Martin, Peter G.: *See*—
Arciprete, Genio R.; and Martin, Peter G., 3,821,710.

Martin, Roger C., 1/2 to Griffis, Edgar E. Scallop measuring device. 3,820,394, Cl. 73-223.000.

Martin, Stephen F. Primary fuel burning apparatus. 3,820,337, Cl. 60-699.000.

Martin, Thomas B.: *See*—
Herscher, Marvin B.; and Martin, Thomas B., 3,821,472.

Martland, Wallace A.: *See*—
Curley, John L.; Donahue, Thomas J.; Franklin, Benjamin S.; Martland, Wallace A.; and Cornaro, Louis V., 3,821,709.

Martuch, Leon L.; and Kreh, Bernard, to Scientific Anglers, Inc. Fishing line. 3,820,271, Cl. 43-44.980.

Marus, Louis J.: *See*—
Marus, Louis J.; and Abernathy, James D. (said Abernathy assor. of 7.4% to said), 3,821,699.

Marus, Louis J.; and Abernathy, James D., said Abernathy assor. of 7.4% to said Marus, Louis J. and said Abernathy assor. of 12.6% to Bogatin, Irvin. Depth sensor for boat trailers. 3,821,699, Cl. 340-59.000.

Maruyama, Kunio: *See*—
Matsumura, Yasuo; and Maruyama, Kunio, 3,821,173.

Maruyama, Yoshio, to Pioneer Electronic Corporation. Tape recorder. 3,821,810, Cl. 360-96.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Simon, Michael, 3,820,468.

Masco Corporation: *See*—
Fathauer, George H.; and Mathis, Cecil E., 3,821,651.

Maskell, Roy: *See*—
Lerner, Martin L.; and Maskell, Roy, 3,821,009.

Maslinkov, Ivan Vasilev: *See*—
Mladenov, Venko Dimitrov; and Maslinkov, Ivan Vasilev, 3,820,547.

Maslov, Sergei Alexeevich: *See*—
Bljumberg, Erna Albertovna; Ivanjukov, Demid Vasilievich; Maslov, Sergei Alexeevich; Norikov, Jury Dmitrievich; Emanuel, Nikolai Markovich; and Boiko, Vladimir Vasilievich, 3,821,259.

Maslov, Viktor Semenovich: *See*—
Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Kantor, Illya Solomonovich; Maslov, Viktor Semenovich; and Alexeev, Gennady Mikhailovich, 3,820,740.

Maslow, Frank Z.: *See*—
Chisholm, John P.; Lennon, William T., Jr.; Doane, James R.; and Maslow, Frank Z., 3,821,523.

Mason, Harry, to United States of America, Atomic Energy Commission. Recording system having piezoelectric stylus drive means. 3,821,747, Cl. 346-62.000.

Mason Scott Thrissell Engineering Limited: *See*—
Wood, David, 3,820,669.

Massie, Stephen N.; and Bloch, Herman S., to Universal Oil Products Company. Preparation of ethers. 3,821,315, Cl. 260-612.00d.

Massman, Richard: *See*—
Chittenden, Richard Marion; Wh:.on, Aldean William; Macalalad, Fidel Vallaluna; Massman, Richard; and Wilson, Earl David, 3,820,546.

Massonne, Joachim: *See*—
Hellberg, Karl-Heinz; Rudolph, Werner; and Massonne, Joachim, 3,821,321.

Masuda, Fumiyoshi: *See*—
Seo, Kiyokazu; Hayashi, Yoshihiro; Hoshino, Tunekichi; and Masuda, Fumiyoshi, 3,820,843.

Matchan, Michael John: *See*—
Stables, Harry Carson; Atherton, John; and Matchan, Michael John, 3,821,208.

Mateja, Eugene V., to Bell & Howell Company. Motor control circuit for dual speed magnetically striped cards. 3,821,622, Cl. 318-305.000.

Materials Management Systems, Inc.: *See*—
Critchlow, Arthur J.; and Bryson, Charles J., 3,820,667.

Mathis, Cecil E.: *See*—
Fathauer, George H.; and Mathis, Cecil E., 3,821,651.

Mathis, Ronald D.: *See*—
Dix, James S.; Mathis, Ronald D.; and Underwood, John H., 3,821,142.

Mathis, Ronald D., to Phillips Petroleum Company. Flame retardant polyolefin composition of improved color and melt stability. 3,821,141, Cl. 260-23.00h.

Mathner, Hermann: *See*—
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weib, Gunter, 3,821,047.

Matier, William Lesley; and Timmey, William, to Mead Johnson & Company. 2-Amino-4-phenyl-2-imidazolines. 3,821,244, Cl. 260-309.600.

Matisovich, Gunar: *See*—
Lavrinovich, Edvard Stanislavovich; Germane, Skaidrite Karlovna; Treigute, Ilze Edgarovna; and Matisovich, Gunar, 3,821,231.

Matsko, Joseph J.; Hill, Robert H.; and Lange, Emroy W., to Westinghouse Electric Corporation. Circuit interrupter protective device. 3,821,607, Cl. 317-33.00r.

Matsudo, Kazuo: *See*—

Kubotera, Haruo; Hashimoto, Yukio; Ohkubo, Masuta; Gonda, Hisashi; Tanaka, Nobuo; Matsudo, Kazuo; and Shimomura, Takayoshi, 3,821,031.

Matsui, Kazuo: *See—*
Kawada, Seigo; Ito, Hideo; Matsui, Kazuo; and Kasugai, Hiroshi, 3,821,395.

Matsumoto, Kunio: *See—*
Abe, Jinnosuke; Watanabe, Tetsuo; Yamaguchi, Tsutomu; Matsumoto, Kunio; and Fujii, Tadashiro, 3,821,081.

Matsumura, Yasuo; and Maruyama, Kunio, to Japan Exlan Company Limited. Process for producing articles of lactonized acrylic polymers having excellent whiteness. 3,821,173, Cl. 260-78.30m.

Matsushita Electric Industrial Co.: *See—*
Amagami, Keizo; Mori, Hazime; Kobayashi, Takao; Kiuchi, Mitsuyuki; and Ogino, Yoshio, 3,821,509.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hirashima, Masayoshi, 3,821,761.
Kawada, Toshio; Torama, Tadashi; and Kobayashi, Tamio, 3,821,807.

Matsushita Electric Industrial Company, Limited: *See—*
Hara, Tohru, 3,821,020.

Matthews, James J., to Utility Tool Corporation. Cutting blades for cables and method therefor. 3,820,420, Cl. 81-9.50r.

Matthews, Joseph S., to Gulf Research & Development Company. Immobilization of enzymes. 3,821,084, Cl. 195-68.000.

Matthews, Lindsey T.: *See—*
Marsello, Bernard D.; and Matthews, Lindsey T., 3,821,499.

Mattsson, Gosta Ambjorn, to Aktiebolaget Atomenergi. Apparatus for alternately irradiating an object by means of at least two radiation sources. 3,821,555, Cl. 250-497.000.

Matty, Thomas C., to Westinghouse Electric Corporation. Apparatus for sensing positions of vehicle along a track using voltage sensing in current track circuits. 3,821,544, Cl. 246-34.0ct.

Mauck, James W.: *See—*
Platz, Gerald M.; Palmer, William H.; and Mauck, James W., 3,820,960.

Maulding, Donald Roy, to American Cyanamid Company. Diquaternary salts of Di-4-pyridyl ketone. 3,821,229, Cl. 260-294.80r.

Maurice, Harvey W.: *See—*
Sieckman, Walter; Maurice, Harvey W.; and Pearce, Jai K., 3,820,768.

Mauthe, Gerhard: *See—*
Hartmann, Hans; Krieter, Georg-Heinz; and Mauthe, Gerhard, 3,821,687.

Maver, William J.; and Rosati, David E., to United Aircraft Corporation. Battery peaking unit for fuel cell power plants. 3,821,626, Cl. 320-3.000.

Maxeiner, Gottfried; and Muhr, Heinrich, to Ehrenreich, A. & Cie. Elastic ball-joint. 3,820,908, Cl. 403-133.000.

Maxwell, James F. Dictionary index. 3,820,824, Cl. 283-36.000.

Mayer, Frank, & Associates, Inc.: *See—*
Crosslen, Louis John, 3,820,862.

Mayer, Oscar, & Co. Inc.: *See—*
Balch, James L.; Anderson, James E.; and Schroeder, Charles J., 3,820,219.

Maynard, Fred B., to Motorola, Inc. Electronic musical instrument. 3,821,460, Cl. 84-1.170.

Maytag Company, The: *See—*
Kaldenberg, Henry J., 3,820,866.

Mazor, Stanley: *See—*
Hoff, Marcian Edward, Jr.; Mazor, Stanley; and Faggin, Federico, 3,821,715.

McCaskill, John Walton, III, to Rockwell Manufacturing Company. Circulation apparatus. 3,820,599, Cl. 166-.500.

McClenahan, James O., to United States of America, National Aeronautics and Space Administration. Photomultiplier circuit including means for rapidly reducing the sensitivity thereof. 3,821,546, Cl. 250-207.000.

McClive, R. Thomas: *See—*
Shaw, Richard N., 3,820,205.

McConnell, Lorne D., to I-T-E Imperial Corporation. Inflated valve seat for synchronous breakers. 3,821,506, Cl. 200-148.0bv.

McCormack, Harley G., to American Hydrophilics Corporation. Power and surface inspection adaptor plate. 3,820,899, Cl. 356-124.000.

McCoy, Frederic C.: *See—*
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McCreight, Louis R.: *See—*
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McCumber, Roger D.: *See—*
Hencley, Richard L.; McCumber, Roger D.; and Hewitt, Donald W., 3,820,455.

McDonald, Alexander B., to McDonnell Douglas Corporation. Speed sensitive actuator. 3,820,748, Cl. 244-149.000.

McDonnell Douglas Corporation: *See—*
McDonald, Alexander B., 3,820,748.
Von Fange, Wilbur H., 3,821,739.

McElreath, Clarence R. Electrotype magnetic printing plate. 3,820,460, Cl. 101-382.0mv.

McEvers, William R., Jr.: *See—*
Richter, Albert P., Jr.; and McEvers, William R., Jr., 3,820,389.

McEwan, William S.; and Drew, Charles M., to United States of America, Navy. Method for measuring liquid particle distribution from fogs, clouds, and sprays. 3,820,953, Cl. 23-230.00r.

McGregor, Donald F.: *See—*
Greenwood, Roger; and McGregor, Donald F., 3,820,755.

McGregor, William H.: *See—*
McKinley, Wayne A.; and McGregor, William H., 3,821,188.

McGrew, Stephen Paul. Constant pressure material. 3,820,162, Cl. 2-2.10a.

McGunigle, Richard D. Signal velocity measurement system. 3,820,393, Cl. 73-204.000.

McInnis, Andrew M., to Sheldon Industries Inc. Elimination of uncontrolled background reproduction during printing. 3,820,458, Cl. 101-269.000

McKechnie, John C. Sound enhancement speaker enclosure. 3,821,475, Cl. 179-1.00m.

McKelvey, George C.: *See—*
Katunich, Samuel; and McKelvey, George C., 3,820,230.

McKelvey, James F., to United States of America, Navy. Electronic interference detector for range-tracking pulse radar systems. 3,821,752, Cl. 343-7.300.

McKenna, William F., to Atwood Vacuum Machine Company. Electronic ignition system. 3,820,939, Cl. 431-79.000.

McKenny, Vernon G., to Mostek Company. Dynamic random access memory. 3,821,717, Cl. 340-173.00r.

McKie, David Alexander: *See—*
Anderson, Michael L.; Fowler, Harold Wayne; and McKie, David Alexander, 3,820,421.

McKinley, Wayne A.; and McGregor, William H., to American Home Products Corporation. Proline and pyroglutamic acid containing trippeptides. 3,8 1,188, Cl. 260-112.500.

McLagan Co., The: *See—*
McLagan, Erman R., 3,820,419.

McLagan, Erman R., to McLagan Co., The. Method of reducing stress concentration and cracking failures in carbide tipped saws. 3,820,419, Cl. 76-112.000.

McMillin, Carl Kenneth, to Du Pont de Nemours, E. I., and Company. Antistatically protected nonwoven polyolefin sheet. 3,821,021, Cl. 117-135.500.

McNab, Ian Roderick: *See—*
Wilkin, Geoffrey Alan; and McNab, Ian Roderick, 3,821,024.

McNally, George S., to Pullman Incorporated. Railway hopper car closure actuating mechanism. 3,820,473, Cl. 105-250.000.

McNeil Laboratories, Inc.: *See—*
Rasmussen, Chris Royce, 3,821,212.

McNeill, Frank M., to Tee-Pak, Inc. Apparatus for radially winding flexible tubular material. 3,820,732, Cl. 242-55.000.

McVaugh, Arthur K., to Champion Corporation. Loading and unloading means for cable reels and other structures. 3,820,673, Cl. 214-77.00r.

Mead Johnson & Company: *See—*
Matier, William Lesley; and Timmey, William, 3,821,244.

Meadows, Roger D., to Dayco Corporation. Endless power transmission belt. 3,820,409, Cl. 74-233.000.

Measurex Corporation: *See—*
French, John Michael, 3,821,553.

Medema, William H., to Oolite Industries, Inc. Tapered piles and methods of using tapered piles. 3,820,347, Cl. 61-56.000.

Medkeff, Arthur T.: *See—*
Nye, Norman H.; and Medkeff, Arthur T., 3,820,666.

Medley, Jackson C.: *See—*
Kress, Edward S.; Kress, Ralph H.; and Medley, Jackson C., 3,820,818.

Meeker, Leeman S.: *See—*
Rowe, Joseph L.; Meeker, Leeman S.; and Calamas, Deleon Everette, 3,820,272.

Meeussen, Louis Achilles: *See—*
Bestenreiner, Friedrich; Helmberger, Josef; Meyer, Rudolf; and Meeussen, Louis Achilles, 3,820,992.

Megumi, Naomitsu: *See—*
Ohe, Fumio; Saito, Yoshio; and Megumi, Naomitsu, 3,820,293.

Mehner, Walter; and Tietz, Werner, to DIEHL. Hinged keyboard switch. 3,821,534, Cl. 200-338.000.

Meier, Jurgen-Dietrich: *See—*
Enders, Edgar; Stendel, Wilhelm; Meier, Jurgen-Dietrich; and Francque, Marc, 3,821,204.

Meier, Otto; and Scheidweiler, Andreas, to Cerberus AG. Fire alarm system with remote central station. 3,821,734, Cl. 340-409.000.

Melacini, Paolo; Patron, Luigi; Moretti, Alberto; and Tedesco, Raffaele, to Montedison Fibre S.p.A. Process for the bulk polymerization of acrylonitrile. 3,821,178, Cl. 260-85.50r.

Melvin, William J., to Collins Radio Company. Three channel PSK data modem apparatus. 3,821,481, Cl. 179-15.00r.

Menasse, Raphael: *See—*
Sturm, Elmar; and Menasse, Raphael, 3,821,247.

Mendies, Patrick John: *See—*
Beck, Maurice Sidney; Calvert, George; Mendies, Patrick John; and Cunlifee, Malcolm, 3,820,392.

Meneghini, Pietro: *See—*
Dall'Asta, Gino; Meneghini, Pietro; and Gennaro, Ugo, 3,821,183.

Menne, Joseph D.; and Sigulas, George N., to Caterpillar Tractor Co. Cutter head and method of forming same. 3,820,227, Cl. 29-445.000.

Mercer, William E. Method of repairing articles made of heat-softenable material. 3,820,221, Cl. 29-401.000.
Merck & Co., Inc.: *See*—
Arth, Glen E.; Sarett, Lewis H.; and Patchett, Arthur A., 3,821,374.
Mandel, Lewis R., 3,821,381.
Mandel, Lewis R., 3,821,409.
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Pessolano, Arsenio A.; Witzel, Bruce E.; Graham, Patricia M.; Clark, Robert L.; and Shen, Tsung-Ying, 3,821,201.
Mergerian, Dickron: *See*—
Bozanic, Donald A.; Mergerian, Dickron; and Minarik, Ronald W., 3,821,636.
Merianos, John J.; and Adams, Phillip, to Millmaster Onyx Corporation. Amino derivatives of tetrasubstituted benzene compounds. 3,821,407, Cl. 424-330.000.
Merrell, Richard G., to Zenith Radio Corporation. Phase correction for horizontal oscillator in cmos form. 3,821,470, Cl. 178-69.5tv.
Merritt, Will D., Jr.; and Vestergaard, Jorgen H., to General Electric Company. Organopolysiloxane-polycarbonate block copolymers. 3,821,325, Cl. 260-824.00r.
Merryweather, Gerald. Flag pole combination. 3,820,500, Cl. 116-174.000.
Mertens, Ludovicus Lucas; van den Houte, Jozef Willy; and van Royen, Freddy Ghisleen, to Agfa-Gevaert N.V. Photochromic material containing a spiropyran compound, a polyhalogenated hydrocarbon photoactivator and an acetanilide sensitizer and the use thereo in photoimaging. 3,820,995, Cl. 96-48.00r.
Meserve, Forrest Clayton; and Raabe, Ralph Christian, Jr., to Bandag Incorporated. Siping drum and apparatus for forming siping slashes. 3,820,580, Cl. 157-13.000.
Messer Griesheim GmbH: *See*—
Fenger, Horst; and Pfeifer, Ferdinand, 3,820,598.
Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung: *See*—
Karch, Ludwig; and Nowack, Siegfried, 3,820,470.
Met, Viktor: *See*—
Kindl, Helmut; and Met, Viktor, 3,820,903.
Metallgesellschaft Aktiengesellschaft: *See*—
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Metex Corporation: *See*—
Bakker, Willem F., 3,821,463.
Metscher, Klaus: *See*—
Bilal, Abdel-Latif; Metscher, Klaus; and Zimen, Karl-Erik, 3,821,091.
Metz, Paul, to Acieries Reunies de Burbacl-Eich-Dudelange, S.A. Apparatus for the treatment of molten metal. 3,820,767, Cl. 266-34.00t.
Metzger, Horst: *See*—
Koenig, Horst; Metzger, Horst; and Reif, Werner, 3,821,277.
Metzger, Robert W., Jr.: *See*—
Harland, Glen E., Jr.; and Metzger, Robert W., Jr., 3,821,780.
Meyer, Charles A. Sequentially operable control valve for a steam turbine. 3,820,756, Cl. 251-121.000.
Meyer, Karl-Heinrich: *See*—
Dietzel, Karl; Peilstocker, Gunter; Meyer, Karl-Heinrich; and Streib, Hugo, 3,821,071.
Meyer, Klaus: *See*—
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Meyer, Rudolf: *See*—
Bestenreiner, Friedrich; Helmberger, Josef; Meyer, Rudolf; and Meeussen, Louis Achilles, 3,820,992.
Meyers, Joseph A., III: *See*—
Taylor, Robert C.; Koncos, Robert; and Meyers, Joseph A., III. 3,821,067.
Miale, Joseph N.: *See*—
Haag, Werner O.; and Miale, Joseph N., 3,821,278.
Michael, Harold J., to Rockwell International Corporation. Electrically-conductive ceramic-metallic protective coating. 3,821,019, Cl. 117-105.200.
Michiko, Onuki. Sterilizing air filter with formation of wet, obeaginous and durable sterilizing coating of filter body. 3,320,308, Cl. 55-279.000.
Midland Industrial Computing Limited: *See*—
Anderson, John Ernest, 3,821,526.
Midland-Ross Corporation: *See*—
Miyoshi, Ichiro; and Tokitsu, Tetsuya, 3,820,946.
Mieda, Fumio, to Keio Giken Kogiyo Kabushikiksishiya. Tone generator circuit for electric or electronic musical instruments. 3,821,461, Cl. 84-1.190.
Mihalev, Nikolai Alexandrovich; and Shtarkman, Boris Petrovich. Continuous polymerization reactor. 3,820,957, Cl. 23-285.000.
Mikhail, Edward M.; Stevenson, Warren H.; Kurtz, Maurice K., Jr.; and Balasubramanian, N., to United States of America, Army. Method and apparatus for mensuration of three-dimensional objects and of stereomodels of such objects. 3,820,895, Cl. 356-2.000.
Miki, Yukio: *See*—
Kobota, Isamu; and Miki, Yukio, 3,820,883.
Milbert, Gerard, to Rhone-Poulenc, S.A. Organopolysiloxane compositions. 3,821,140, Cl. 260-18.00s.
Miley, George E. Heat activated, self discharging fire extinguisher. 3,820,607, Cl. 169-58.000.
Milgate, Robert White, Jr.: *See*—
Titterington, William Alexander; and Milgate, Robert White, Jr., 3,820,956.
Milik, Rudolf F. L., to Evans, Trevor G., James, Michael and Ryder, Geoffrey A. Mixing machines. 3,820,760, Cl. 259-8.000.
Millar, James S.; and Henderson, Glenn W., to Parker-Hannifin Corporation. Fluid flow control system. 3,820,556, Cl. 137-220.000.
Millar, Philip Glenn: *See*—
Cassidy, John Edward; and Millar, Philip Glenn, 3,821,357.
Miller, Alan R., to EDN Corporation. Harness cable lacing tool. 3,821,058, Cl. 156-468.000.
Miller, Bennie S. T. V. project-o-scope. 3,820,885, Cl. 353-98.000.
Miller, David M. Position authentication system for information-bearing devices. 3,821,518, Cl. 235-61.110.
Miller, Gerald G.; and Zickefoose, Rox L., to National Steel Corporation. Sampling molten metal baths. 3,820,380, Cl. 73-19.000.
Miller, Harold E.; and Miller, Robert E., to Curbmaster of America, Inc. Curb and gutter forming machine. 3,820,913, Cl. 404-98.000.
Miller, Paul W., to Wean United, Inc. Apparatus for deflecting sheet-like material. 3,820,775, Cl. 271-64.000.
Miller, Robert E.: *See*—
Miller, Harold E.; and Miller, Robert E., 3,820,913.
Miller, Stanley J., to National Can Corporation. Method for conditioning cans. 3,820,423, Cl. 82-47.000.
Miller, Wayne Russel; and Termont, Charles George, to Deere & Company. Vehicle power steering electrohydraulic safety backup system. 3,820,620, Cl. 180-79.20r.
Milligan, James Douglas: *See*—
Trevoy, Lloyd Woodbury; Greenfield, Jeremy; Bigland, Christopher Hedley; Milligan, James Douglas; and Moisey, John Roman, 3,821,412.
Millmaster Onyx Corporation: *See*—
Merianos, John J.; and Adams, Phillip, 3,821,407.
Milovancevic, Slavko. D-C voltage multipliers and polarity converters. 3,821,627, Cl. 321-2.000.
Minarik, Ronald W.: *See*—
Bozanic, Donald A.; Mergerian, Dickron; and Minarik, Ronald W., 3,821,636.
Minasian, John L. Radio receiving means. 3,821,647, Cl. 325-356.000.
Minieri, Pasquale P., to Tenneco Chemicals, Inc. Surface-coating compositions containing N-(substituted indazolyl-Nl-methyl) alkyleneimines. 3,821,180, Cl. 260-89.100.
Minister of Supply, in Her Majesty's Government: *See*—
Jones, Sydney, 3,821,551.
Minnesota Mining and Manufacturing Company: *See*—
Blackley, William D.; and Berntson, Leslie G., 3,821,150.
Clunis, Kenneth, 3,820,701.
Fairbanks, Charles W.; and Leinen, Roger W., 3,821,055.
Kliewer, George G.; Roberts, John H.; and Gee, Glen R., 3,820,499.
Minolta Camera Kabushiki Kaisha: *See*—
Imura, Toshinori, 3,821,769.
Kobori, Toshio, 3,821,757.
Kobota, Isamu; and Miki, Yukio, 3,820,883.
Okano, Yukio, 3,821,795.
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Yoshida, Ryonosuke; Saito, Tadaomi; and Shimizu, Akira, to Rikagaku Kenkyusho and Ajinomoto Co., Ltd. Method of combatting bacteria or fungi on plants using amino acid higher alkyl esters. 3,821,403, Cl. 42-311.000.
Mishkin, Abraham Rudolph; and Anderson, James Leroy, to Societe d'Assistance Technique pour Produits Nestle. Freeze-drying process. 3,820,250, Cl. 34-5.000.
Mita Industrial Company, Ltd.: *See*—
Morikawa, Hiroichi; Nagahashi, Keiichi; and Aizawa, Tatsuo, 3,821,113.
Nihyakumen, Kouzi; Yokoyama, Taizo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, 3,820,996.
Mitchell, Lawrence C., to Ethyl Corporation. Smoke retardant compositions. 3,821,151, Cl. 260-31.80r.
Mitchell, William A.; and Seidel, William C., to General Foods Corporation. Preparation of an alcohol-containing powder. 3,821,433, Cl. 426-192.000.
Mitoff, Stephan P.: *See*—
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Mitsche, Roy T.; Hayes, John C.; Wilhelm, Frederick C.; and Rausch, Richard E., to Universal Oil Products Company. Multimetallic catalyst composite and uses thereof. 3,821,105, Cl. 208-139.000.
Mitsubishi Chemical Industries Limited: *See*—
Kawada, Seigo; Ito, Hideo; Matsui, Kazuo; and Kasugai, Hiroshi, 3,821,395.
Mitsubishi Denki Kabushiki Kaisha: *See*—
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Mizusawa, Motoo; Takeichi, Yoshihiro; and Betsudan, Shinichi, 3,821,746.
Ueda, Atsushi; and Ishii, Mitsuaki, 3,821,559.
Mitsubishi Petrochemical Company Limited: *See*—
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Mitsubishi Yuka Kabushiki Kaisha: *See*—
Sudo, Michio, 3,821,343.
Miyakawa, Seinan; and Noda, Nobuhiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electric camera shutter controls capable of indicating exposure time. 3,821,758, Cl. 354-51.000.
Miyamoto, Koichi: *See*—

Nitanda, Hiroshi; Hattori, Hiroyuki; and Miyamoto, Koichi, 3,820,889.
Miyata, Katsuhiko: *See—*
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Miyazako, Takushi: *See—*
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Miyoshi, Ichiro; and Tokitsu, Tetsuya, to Midland-Ross Corporation. Longitudinally fired walking beam furnace. 3,820,946, Cl. 432-121.000.
Mize, John L., to Beta Industries, Inc. Solid state emitting device and method of producing the same. 3,821,773, Cl. 357-16.000.
Mizukoshi, Masahiko: *See—*
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Mizumoto, Yosinori: *See—*
Mizutani, Yukio; Kusumoto, Koshi; and Mizumoto, Yosinori, 3,821,127.
Mizuno, Yukio, to Nissan Motor Company, Limited. Weft selector mechanism of a fluid jet loom. 3,820,574, Cl. 139-127.00p.
Mizusawa, Motoo; Takeichi, Yoshihiro; and Betsudan, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Antenna system with distortion compensating reflectors. 3,821,746, Cl. 343-781.000.
Mizutani, Yukio; Kusumoto, Koshi; and Mizumoto, Yosinori, to Tokuyama Soda Kabushiki Kaisha. Anion exchange membranes and method of their production. 3,821,127, Cl. 260-2.10e.
MI², Incorporated: *See—*
Fretwell, Charles C., 3,821,653.
Mladenov, Venko Dimitrov; and Maslinkov, Ivan Vasilev, to DSO Agromachina. Vertical cylinderical corn husking apparatus. 3,820,547, Cl. 130-5.00b.
Mobil Oil Corporation: *See—*
Goyer, Andre; and Smadja, Rene, 3,821,144.
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Owen, Hartley; and Demmel, Edward J., 3,821,103.
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Mogi, Takaaki, to Nissan Motor Company, Limited. Lighting system for controlling lights of motor vehicle to glow in a reduced luminous intensity during the nighttime. 3,821,702, Cl. 340-81.00r.
Mohammed, Kasheed, to Johnson & Johnson. Bland amono acid compositions. 3,821,432, Cl. 426-167.000.
Mohrhauser, John P.: *See—*
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Molatalab, Hossien, 20% to Lee, Raymond, Organization, Inc., The. Automobile convertible either to sedan or station wagon. 3,820,839, Cl. 296-99.000.
Molatalab, Hossien, 20% to Lee, Raymond, Organization, Inc., The. Automobile convertible either to sedan or station wagon. 8,320,839, Cl. 296-99.000.
Moller, Friedhelm. Happe & Co., Firma Steerable assembly for wheelchairs and the like. 3,820,190, Cl. 16-35.000.
Moller, Hermann: *See—*
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Montecatini Edison S.p.A.: *See—*
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Montedison Fibre S.p.A.: *See—*
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Melacini, Paolo; Patron, Luigi; Moretti, Alberto; and Tedesco, Raffaele, 3,821,178.
Montgomery, Kenneth O.; and Jhaveri, Chandrakant R., to Central Pharmacal Company, The. Process for preparing an iron-saccharide complex. 3,821,192, Cl. 260-209.00r.
Monti, Anthony, to Su Crest Corporation. Direct compression vehicle. 3,821,414, Cl. 424-361.000.
Moor, Wilhelm, to Industrie AG. Allegro. Device for unwinding thread windings. 3,820,736, Cl. 242-110.200.
Moore, Brian B.: *See—*
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Moore, Joseph E., to Chevron Research Company. Hydrocarbyl sulfenylmercapto pyrimidines. 3,821,222, Cl. 260-256.50r.
Moore, William R.; and Erickson, Robert E., to Dow Chemical Company, The. Modified turbine engine fuel. 3,820,963, Cl. 44-62.000.
Moorhead, John P.; and Stratton, Donald W., to Anderson Company, The. Windshield wiper blade structure. 3,820,188, Cl. 15-250.420.
Moosmann, Alois. Advancing drive for slides on machine tools. 3,820,412, Cl. 74-422.000.
Moretti, Alberto: *See—*
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Mori, Hazime: *See—*
Amagami, Keizo; Mori, Hazime; Kobayashi, Takao; Kiuchi, Mitsuyuki; and Ogino, Yoshio, 3,821,509.
Morikawa, Hiroichi; Nagahashi, Keiichi; and Aizawa, Tatsuo, to Mita Industrial Company, Ltd. Liquid developer for electrophotography. 3,821,113, Cl. 252-62.100.
Morin, Louis F., to Everflex Products, Inc. Flexible hose coupling and swivel nut connector assembly. 3,820,825, Cl. 285-39.000.
Morinaga, Fumihiko: *See—*
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Morren, George J.; and Berndt, Neil R., to Speidel Foundation & Marine, Inc. Self-supporting wall. 3,820,343, Cl. 61-35.000.
Morrett, James A., Jr. Vehicle redirection configuration. 3,820,910, Cl. 404-6.000.
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Morris, Earl F.: *See—*
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Morton, John R.: *See—*
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Moser, Peter: *See—*
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Motch & Merryweather Machinery Company, The, mesne: *See—*
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Motley, Herman R.; Morris, Earl F.; and Pavlich, Joseph P., to Dow Chemical Company, The. Use of a spacer composition in well cementing. 3,820,602, Cl. 166-291.000.
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Moulton, Alexander Eric; and Best, Anthony, to Moulton Developments Limited. Vehicle rear wheel suspension arrangement. 3,820,813, Cl. 280-124.00a.
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Mowdood, Syed K., to Goodyear Tire & Rubber Company, The. Fire retardant polymer containing octachlorocyclopentene. 3,821,159, Cl. 260-45.70r.
Moyer, James E. Extendable and retractable motor vehicle mirror arms. 3,820,877, Cl. 350-289.000.
Mozer, Larry P., to Phillips Petroleum Company. Internal cooling of polyethylene terephthalate tubing. 3,821,349, Cl. 264-209.000.
Mrozik, Helmut H.; and Bochis, Richard J. 3-Cyanobenzenesulfonamides. 3,821,276, Cl. 260-465.00e.
Mucsi, Michael. Safety closure assembly and container. 3,820,676, Cl. 215-9.000.
Muehldorf, Eugen Igor: *See—*
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Mueller, Edwin R., to Rex Chainbelt Inc. Combination valve. 3,820,558, Cl. 137-269.00x.
Mueller, Peter F., to Technical Operations, Incorporated. Spectral zonal information storage and retrieval. 3,820,878, Cl. 350-317.000.
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Mulder, Albertus J.; and van Helden, Robert, to Shell Oil Company. Process for the preparation of thiohydroximic esters. 3,821,266, Cl. 260-453.00r.
Mullen, Patrick E.: *See—*
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Muller, Karl-Heinz; Rohr, Harry; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Thermoplastic binders for continuously produced leads for pencils, copying pencils and coloured pencils. 3,821,157, Cl. 260-41.00r.

Muller-Calgan, Helmut: *See—*
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Mullins, Joe H. Sound reproduction system with driven and undriven speakers and motional feedback. 3,821,473, Cl. 179-1.00f.

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Muncheryan, Hrand M. Hand-held laser instrumentation device. 3,821,510, Cl. 219-121.00l.

Murakami, Kiyohiko: *See—*
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Murakami, Takeshi; Nakamura, Yukio; Onda, Eiichi; and Morino, Yukio, to Seiko Koki Kabushiki Kaisha. Indicating circuit for camera visually indicating need for flash exposures and periods of the exposures. 3,821,750, Cl. 354-32.000.

Murakami, Tsuyoshi: *See—*
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Musher, Arthur Albert; deceased (by Musher, Selma). Container and measuring plug. 3,820,690, Cl. 222-490.000.

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Mussman, Harry Edward, to Bell Telephone Laboratories, Incorporated. Bridge-type supervisory detector with reduced breakdown voltage requirements. 3,821,486, Cl. 179-18.0fa.

Muz, Edwin, to BBC Brown Boveri & company Limited. Irradiation lamp system. 3,821,595, Cl. 315-129.000.

Myers, Robert E. Bag closure. 3,820,200, Cl. 24-30.50s.

N. W. Controls, Inc.: *See—*
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Nagakura, Katsuhiko; and Kamoto, Hidetoshi, to Sony Corporation. Electronic calculator having an indicator blanking circuit. 3,821,535, Cl. 235-156.000.

Nagata, Yasushi. Method of manufacturing thermistor. 3,820,239, Cl. 29-612.000.

Nahory, Robert Edward: *See—*
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Naito, Shun-Ichi. 2-(β-Aminoethylsulfonylamino) thiazole. 3,821,238, Cl. 260-306.80r.

Nakagawa, Yasuo; and Akiyama, Nobuyuki, to Hitachi, Ltd. Mask alignment in manufacturing semiconductor integrated circuits. 3,821,545, Cl. 250-20.100.

Nakajima, Kazuhiko, to Sony Corporation. White balance control system. 3,821,791, Cl. 358-29.000.

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Nakamura, Yasush., Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, to Sumitomo Chemical Company, Ltd. Phenoxy carboxylic acid derivatives as anti-atherosclerosis agents. 3,821,404, Cl. 424-317.000.

Nakamura, Yukio: *See—*
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Nakanishi, Motoyoshi. Safety mask. 3,820,538, Cl. 128-142.200.

Nakano, Ryuzo; Yamazaki, Shinichiro; and Ogasawara, Shinzi, to Aisin Seiki Kabushiki Kaisha. Door hinge unit. 3,820,192, Cl. 16-145.000.

Nakano, Takuji: *See—*
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Nakaya, Shintaro: *See—*
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Nakazato, Susumu, to Continental Oil Company, mesne. Method of assembling nuclear reactor fuel element spacer assembly. 3,820,226, Cl. 29-428.000.

Nambu, Shyuya, to Nissan Motor Company, Limited. Fuel injection system. 3,820,517, Cl. 123-32.0ea.

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Naradi Narodni podnik: *See—*
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National Distillers and Chemical Corporation: *See—*
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National Machinery Company, The: *See—*
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National Sea Products Limited: *See—*
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Negherbon, Ann C. Double skirt sheath dress. 3,820,165, Cl. 2-74.000.

Neill, William M.; and Burt, George A., Jr., to International Paper Company. Cap making apparatus and method. 3,820,484, Cl. 112-121.260.

Nelson, Gordon L.; and Webb, Jimmy L., to General Electric Company. Apparatus for determining the oxygen index of liquid and non-moulded solids. 3,820,379, Cl. 73-15.00r.

Nelson, Perry L.: *See—*
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Neuers, Lucien, to Thomson-CSF. Anchoring system for a structure carried by a vehicle supporting heavy bodies. 3,820,816, Cl. 280-150.500.

New, Robert V. Method of reducing environmental pollution by utilizing stack gases, resulting from the burning of fossil fuels, and water, including sea water, to manufacture hydrocarbon energy fuel, potable water and other commercial products. 3,820,965, l. 48-197.00r.

Newallis, Peter E.: *See—*
Poje, Albert J.; and Newallis, Peter E., 3,820,975.

Newman, Barry G., to Marc Manufacturing Inc. Floor mat with electrical switch. 3,821,500, Cl. 200-86.00r.

Newton, Elbert J. Bite signal for fishing rod. 3,820,268, Cl. 43-17.000.

NHK Spring Co., Ltd.: *See—*
Shiguma, Heijiro; and Suzuki, Shigekazu, 3,820,373.

Nicholson, John Stuart: *See—*
Adams, Stewart Sanders; Armitage, Bernard John; Nicholson, John Stuart; and Blancafort, Antonio Ribera, 3,821,293.

Nickelson, Robert William: *See—*
Brunning, Elmer Eugene; Grover, Donald P.; Schild, Manfred; and Nickelson, Robert William, 3,820,808.

Nicolas, Pierre: *See—*
Kalina, Vladimir; and Nicolas, Pierre, 3,821,080.

Nicolay, Karl, to Durkoppwerke G.m.b.H. Device for use in sewing apparatus. 3,820,481, Cl. 112-68.000.

Nieuwenhover, Hendricus Jacobus Cornelis: *See—*
van der Lely, Cornelis; and Nieuwenhover, Hendricus Jacobus Cornelis, 3,820,216.

Nihon Shinku Gejutsu Kabushiki Kaisha (Culvac Corporation en England): *See—*
Takei, Hiromichi, 3,820,586.

Nihyakumen, Kouzi; Yokoyama, Taizo; Kamezawa, Yasutoki; and Aizawa, Tatsuo, to Mita Industrial Company, Ltd. Process for development of two-component diazotype photosensitive materials. 3,820,996, Cl. 96-49.000.

Nikiforov, Vladimir Pavlovich; Nosikov, Vasily Ivanovich; Kil, Ilya Genrikhovich; Tsybukov, Igor Kirillovich; Smorodinov, Alexandr Nikolaevich; Tsyplakov, Anatoly Mikhailovich; Budkevich, Nikolai Pavlovich; and Vykhodov, Nikolai Ivanovich. Wiring system ofelectrolyzers for producing aluminum. 3,821,101, Cl. 204-243.00r.

Nikkawa, Hisashi: *See—*
Ohmae, Kenji; Shinada, Hidehiro; and Nikkawa, Hisashi, 3,820,937.

Nikolaev, Georgy Vasilievich: *See—*
Chernyshev, Petr Sergeevich; Spiridonov, Konstantin Alexeevich; Pakhomov, Vladimir Alexandrovich; Nikolaev, Georgy Vasilievich; Volfson, Izrail Mordukhovich; Levchenko, Boris Leonidovich; Ryzhkov, Viktor Kuzmich; Gladkovsky, Petr Stanislavovich; Shargorodsy, Viktor Semenovich; and Shlyapin, Alexandr Nikolaevich, 3,820,915.

Nilsson, Jan: *See—*
Larker, Hans; and Nilsson, Jan, 3,820,229.

Nilsson, Lars: *See—*
Mansson, Ragnar; Nilsson, Lars; Noberius, Leif; and Sundqvist, Cnut, 3,821,078.

Ninet, Leon: *See—*
Mancy, Denise; Ninet, Leon; and Preud'Homme, Jean, 3,821,366.

Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.): *See—*
Kobayashi, Yoshikazu, 3,821,788.
Yoneyama, Masahide, 3,821,794.

Nippon Electric Company, Limited: *See—*
Chiba, Seibi, 3,821,493.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Hayashida, Hajime, 3,820,433.
Tomisawa, Norio; Uchiyama, Yasuji; Okumaru, Takatoshi; and Takeda, Toshio, 3,821,714.

Nippon Kokan Kabushiki Kaisha: *See—*
Kubotera, Haruo; Hashimoto, Yukio; Ohkubo, Masuta; Gonda, Hisashi; Tanaka, Nobuo; Matsudo, Kazuo; and Shimomura, Takayoshi, 3,821,031.
Yamagishi, Kazuo; Banba, Toshitugu; and Nakajima, Takeji, 3,821,032.

Nippon Suisan Kabushiki Kaisha: *See—*
Okamura, Eijiro; and Takahashi, Toshikatsu, 3,821,445.

Nippondense Co. Ltd.: *See—*
Suda, Toshi; and Isomura, Takuji, 3,820,519.

Nischk, Gunther: *See—*
Arend, Gunter; Radlmann, Eduard; and Nischk, Gunther, 3,821,176.
Radlmann, Eduard; and Nischk, Gunther, 3,821,281.

Nissan Motor Company, Limited: *See—*
Ezoe, Mitsuhiko; and Inoue, Naohiko, 3,820,619.
Mizuno, Yukio, 3,820,574.
Mogi, Takaaki, 3,821,702.
Nambu, Shyuya, 3,820,517.

Nitanda, Hiroshi; Hattori, Hiroyuki; and Miyamoto, Koichi, to Canon Kabushiki Kaisha. Copy sheet guide device in electrophotographic copying machine. 3,820,889, Cl. 355-3.00r.

Nithart, Henri: *See—*
Ruelle, Gilbert; Carlier, Jacques; and Nithart, Henri, 3,821,574.

Noberius, Leif: *See—*
Mansson, Ragnar; Nilsson, Lars; Noberius, Leif; and Sundqvist, Cnut, 3,821,078.

Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure time controls for cameras. 3,821,754, Cl. 354-24.000.

Noda, Nobuhiro: *See—*
Miyakawa, Seinan; and Noda, Nobuhiro, 3,821,758.

Noguchi, Teruhisa; Asada, Mitsuo; Sakimoto, Reiji; and Hashimoto, Koichi. Benzohydroxamates and their use as acaricides. 3,821,402, Cl. 424-308.000.

Noir, Rene. Connecting device for attaching safety belt to vehicle floor. 3,820,815, Cl. 280-150.0sb.

Nomura, Katsuhiko: *See—*
Urano, Fumio; Uno, Naoyuki; Nomura, Katsuhiko; Watanabe, Koichiro; Sakazaki, Tadazumi; and Miyata, Katsuhiko, 3,821,768.

Norder, Paul D.: *See—*
Sisson, Jeffrey L.; and Norder, Paul D., 3,820,591.

Nordsiek, Karl-Heinz: *See—*
Streck, Roland; Nordsiek, Karl-Heinz; Weber, Heinrich; and Meyer, Klaus, 3,821,328.

Nordstrom, Donald B.; and Napierkowski, Peter, to Solitron Devices, Inc. Long life lead frame means for semiconductor devices. 3,821,615, Cl. 317-234.00r.

Nordstrom, Gert: *See—*
Bostrom, Sture; and Nordstrom, Gert, 3,820,762.

Norikov, Jury Dmitrievich: *See—*
Bljumberg, Erna Albertovna; Ivanjukov, Demid Vasilievich; Maslov, Sergei Alexeevich; Norikov, Jury Dmitrievich; Emanuel, Nikolai Markovich; and Boiko, Vladimir Vasilievich, 3,821,259.

North Electric Company: *See—*
Sternung, Sven Y.; and Cowden, Earl T., 3,821,484.
Svala, Carl Gunnar, 3,821,637.

Northeast Electronics Corporation: *See—*
Hillman, Alfred Kimball, Jr.; Wochholz, Harold Frederick; and Penick, Dixon Brown, 3,821,478.

Northern Electric Company Limited: *See—*
Effer, Dennis, 3,820,237.
Kosman, Karel Jan Williams; and Boivin, Louis-Philippe, 3,821,590.

Norton Company: *See—*
Erikson, Leslie E., 3,820,290.

Nosikov, Vasily Ivanovich: *See—*
Nikiforov, Vladimir Pavlovich; Nosikov, Vasily Ivanovich; Kil, Ilya Genrikhovich; Tsybukov, Igor Kirillovich; Smorodinov, Alexandr Nikolaevich; Tsyplakov, Anatoly Mikhailovich; Budkevich, Nikolai Pavlovich; and Vykhodov, Nikolai Ivanovich, 3,821,101.

Novak, John. Fly and insect trap. 3,820,273, Cl. 43-113.000.

Novak, Warren D. Dial compass. 3,820,244, Cl. 33-27.00c.

Noveroske, Robert L., to Dow Chemical Company, The. Method and composition for the stimulation of plant growth. 3,820,973, Cl. 71-77.000.

Novick, William J., Jr.: *See—*
Diamond, Julius; and Novick, William J., Jr., 3,821,406.

Nowack, Siegfried: *See—*
Karch, Ludwig; and Nowack, Siegfried, 3,820,470.

Numbers, J. L.; and Bailey, Guy, to Bailey, Guy. Toilet brush with improved universal joint. 3,820,187, Cl. 15-244.00a.

N.V. Leidsche Apparatenfabriek: *See—*
Van Der Meer, Leonardus Petrus, 3,820,305.

N.V. Meubelfabriek "Deco": *See—*
Verholt, Johannes Maria, 3,820,299.

N.V. Werktuigenfabriek Mulder: *See—*
Van Vliet, Cors, 3,820,526.

Nye, Norman H.; and Medkeff, Arthur T. Apparatus for picking up and transferring light articles. 3,820,666, Cl. 214-1.0bv.

Nye, William M.; and Jones, Stanley W., to Lanier Electronic Laboratory, Inc., mesne. Tape movement indication means and signalling device. 3,821,802, Cl. 360-72.000.

Oak Industries Inc.: *See—*
Van Benschoten, Peter J., 3,821,528.

O'Brien, William L.: *See—*
Copeland, Mark I.; O'Brien, William L.; and Blickensderfer, Robert, 3,821,036.

O'Callaghan, Jerome J. Method and apparatus for cutting roller-type chain. 3,820,224, Cl. 29-427.000.

Occhipinti, Peter W.; and Toriello, Anthony. Practice tennis racket. 3,820,785, Cl. 273-29.00a.

Ogasawara, Shinzi: *See—*
Nakano, Ryuzo; Yamazaki, Shinichiro; and Ogasawara, Shinzi, 3,820,192.

Ogawa, Toshiyuki: *See—*
Fujimoto, Sakae; Satomi, Tokokazu; Tomizuka, Mituo; Yamauchi, Masayuaki; and Ogawa, Toshiyuki, 3,820,776.

Ogino, Shigeo; Kishimoto, Fumitaka; and Wada, Hiroo, to Sumitomo Chemical Company, Limited. Separation of benzodiazepine compounds. 3,821,203, Cl. 260-239.30d.

Ogino, Yoshio: *See—*
Amagami, Keizo; Mori, Hazime; Kobayashi, Takao; Kiuchi, Mitsuyuki; and Ogino, Yoshio, 3,821,509.

Ogiwara, Shinichi: *See—*
Tomita, Tsutomu; Mizukoshi, Masahiko; Ogiwara, Shinichi; and Maeda, Ayahiko, 3,821,441.

Ogle, James A., to Burroughs Corporation. Display panel. 3,821,586, Cl. 313-188.000.

Ohe, Fumio; Saito, Yoshio; and Megumi, Naomitsu, to Tokyo Plywood Kabushiki Kaisha. Framed structural member and board structure composed of short timbers assembled. 3,820,293, Cl. 52-127.000.

Ohio Art Company: *See—*
Replogle, Robert W.; Clark, Earl D.; Goldenetz, Robert A.; and English, Eugene E., 3,820,267.

Ohkubo, Kinji: *See—*
Tsuji, Nobuo; Miyazako, Takushi; Ohkubo, Kinji; and Kato, Kazunobu, 3,820,999.

Ohkubo, Masuta: *See—*
Kubotera, Haruo; Hashimoto, Yukio; Ohkubo, Masuta; Gonda, Hisashi; Tanaka, Nobuo; Matsudo, Kazuo; and Shimomura, Takayoshi, 3,821,031.

Ohmae, Kenji; Shinada, Hidehiro; and Nikkawa, Hisashi, to Tokyo Shibaura Electric Company Limited. Electric flash bulb for use as indicator. 3,820,937, Cl. 431-13.000.

Ohnaka, Hidemi: *See—*
Inoue, Tokuta; Sawada, Hiroshi; Ohnaka, Hidemi; and Ohshiro, Takao, 3,820,326.

Ohno, Takashi: *See—*
Katsuda, Yoshio; and Ohno, Takashi, 3,821,260.

Ohsawa, Mitsuo, to Sony Corporation. Apparatus for reproducing quadraphonic sound. 3,821,474, Cl. 179-1.0gq.

Ohshiro, Takao: *See—*
Inoue, Tokuta; Sawada, Hiroshi; Ohnaka, Hidemi; and Ohshiro, Takao, 3,820,326.

Ohta, Shigenori: *See—*
Yamamoto, Atsushi; and Ohta, Shigenori, 3,821,126.

Oickle, Dawson Eugene, to National Sea Products Limited. Ejection means for apparatus for processing food stuff. 3,820,449, Cl. 99-485.000.

Oil-Rite Corporation: *See—*
Lyden, Frank J., 3,820,397.

Oiles Kogyo Kabushiki Kaisha: *See—*
Abe, Wataru; Terada, Yasuyuki; and Sugafuji, Akira, 3,821,111.

Okagaki, Hiroshi: *See—*

Tomita, Sadami; Hosoya, Akira; and Okagaki, Hiroshi, 3,820,487.
Okamura, Eijiro; and Takahashi, Toshikatsu, to Nippon Suisan Kabushiki Kaisha. Method for processing meats. 3,821,445, Cl. 426-370.000.
Okano, Yukio, to Minolta Camera Kabushiki Kaisha. Optical low-pass filter. 3,821,795, Cl. 358-47.000.
O'Keefe, Robert F., to Automatic Switch Co., mesne. Discovery in a fluidic computer. 3,821,537, Cl. 235-201.0pf.
Okonite Company, The: *See—*
Alia, Dominic Anthony, 3,821,139.
Okuda, Hironori: *See—*
Maki, Naoki; and Okuda, Hironori, 3,820,471.
Okumaru, Takatoshi: *See—*
Tomisawa, Norio; Uchiyama, Yasuji; Okumaru, Takatoshi; and Takeda, Toshio, 3,821,714.
Olin Corporation: *See—*
Staba, Edward A., 3,820,578.
Olin Energy Systems Ltd.: *See—*
Stigler, Anton, 3,820,934.
Olin Mathieson Chemical Corporation: *See—*
Kraus, Theodore C.; Scruggs, James A.; and Trotz, Sameul I., 3,821,360.
Olinkraft, Inc.: *See—*
Sieffert, William G., 3,820,708.
Sieffert, William G., 3,820,709.
Oliva, Fred P.: *See—*
Rosenstein, William; and Oliva, Fred P., 3,821,770.
Olivares, Jose E. Portable refrigerator and freezer. 3,820,355, Cl. 62-384.000.
Olivetti, Ing. C., & C., S.p.A.: *See—*
Lombardi, Mario, 3,820,646.
Ollivier, Louis A.: *See—*
Sundblom, Leif J.; and Ollivier, Louis A., 3,820,566.
Ollivier, Louis A., to Veriflo Corporation. Ventilator with compliance isolation switch. 3,820,539, Cl. 128-145.800.
Olson, Gaylord G., to SSR Instruments Company. Multi-channel radiation analyzer. 3,820,898, Cl. 356-82.000.
Olsson, Karl-Erik: *See—*
Lindblom, Georg; and Olsson, Karl-Erik, 3,821,564.
Onda, Eiichi: *See—*
Murakami, Takeshi; Nakamura, Yukio; Onda, Eiichi; and Morino, Yukio, 3,821,750.
O'Neal, Cothburn M., to Riverside Press, Inc. Counter. 3,821,522, Cl. 235-137.000.
Ono Pharmaceutical Co., Ltd.: *See—*
Kurono, Masayasu; Komoto, Fusae; Chiba, Takeshi; and Hayashi, Masaki, 3,821,279.
Ono, Yoshio: *See—*
Wada, Eiichi; and Ono, Yoshio, 3,821,808.
Onoe, Morio; and Hirama, Koichi, to Toyo Tsunshinki Kabushiki Kaisha; a/k/a Toyo Communication Equipment Co., Ltd. Multi-crystal oscillator for self temperature compensation. 3,821,666, Cl. 331-162.000.
Oolite Industries, Inc.: *See—*
Medema, William H., 3,820,347.
Ooue, Shingo: *See—*
Hashiue, Masakazu; Ueda, Hiroyuki; Honjo, Satoru; and Ooue, Shingo, 3,821,011.
Oram, John Anderson. Adjustable articulated support arm. 3,820,752, Cl. 248-278.000.
Orb, Inc.: *See—*
Wisotsky, Serge S., 3,820,346.
Orbital Container Corporation: *See—*
Hulse, Murlin L., 3,820,681.
Origa Cylindrar AB: *See—*
Granbom, Bo; and Lundqvist, Karl Gunnar, 3,820,446.
Orlov, Alexandr Mikhailovich: *See—*
Lishevskaya, Marina Osipovna; Virnik, Alexandr Davidovich; Gabrielian, Genrikh Aramaisovich; Rogovin, Zakhar Alexandrovich; Borbat, Vladimir Fedorovich; Orlov, Alexandr Mikhailovich; Ferberg, Mirriam Borisovna; and Markelova, Nina Ivanovna, 3,821,137.
Ormerod, Alan: *See—*
Grindley, William; Bunn, George Edward; Ormerod, Alan; and Harrison, Alwin, 3,820,324.
Orr, Kathleen C., to Compartmented container. . 3,820,656, Cl. 206-72.000.
Osswald, E., Firma: *See—*
Stauber, Siegfried, 3,821,450.
Ost, Joachim, to Siemens Aktiengesellschaft. Method of effecting cyclic, reversible, holographic recording in a thermo-plastic material. 3,821,722, Cl. 340-173.0tp.
Oswald, Richard Karl, to International Business Machines Corporation. Electronic tachometer. 3,820,712, Cl. 235-151.320.
Ota, Yoshihiko: *See—*
Suzuki, Takahiro; and Ota, Yoshihiko, 3,821,797.
Ott, Anton, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Planetary-gear transmission for automotive vehicles. 3,820,418, Cl. 74-759.000.
Ott, Karl-Heinz: *See—*
Muller, Karl-Heinz; Rohr, Harry; and Ott, Karl-Heinz, 3,821,157.
Otto, Charles W., to General Electric Company. Unitary end frame and bearing support member for a dynamoelectric machine. 3,820,863, Cl. 308-132.000.
Otto, Hans: *See—*
Halasz, Istvan; Otto, Hans; Gutlich, Karl Friedrich; and Walkling, Peter, 3,820,660.
Outboard Marine Corporation: *See—*
Borst, Gaylord M.; and Fuelling, William, Jr., 3,820,641.
Owen, Hartley; and Demmel, Edward J., to Mobil Oil Corporation. Conversion of sulfur contaminated hydrocarbons. 3,821,103, Cl. 208-72.000.
Owen, Ronald Charles: *See—*
Klygis, Mindaugas Julius; and Owen, Ronald Charles, 3,820,657.
Owens-Corning Fiberglas Corporation: *See—*
Gelin, Robert J.; and Sanders, James E., 3,821,543.
Owens-Illinois, Inc.: *See—*
Brown, Felix H., 3,821,748.
Buozynski, Leonard M., 3,821,606.
Leuck, Donald D., 3,821,596.
Peters, Edwin F., 3,821,599.
Petty, William D., 3,821,597.
Oy W. Rosenlew AB: *See—*
Ronnholm, Arvi, 3,820,582.
Ozawa, Mitsuo: *See—*
Shirasu, Kazuo; Hatano, Tadao; Shimamura, Isao; Ozawa, Mitsuo; and Iwano, Haruhiko, 3,820,997.
Pabis, Frances E. Wig stand. 3,820,694, Cl. 223-66.000.
Pabst, Rolf, to Daimler-Benz Aktiengesellschaft. Installation for venting the cooling liquid of an internal combustion engine. 3,820,593, Cl. 165-51.000.
Padgett, Richard A., to GTE Automatic Electric Laboratories, Incorporated. Trunk timer with exact time feature. 3,821,718, Cl. 340-173.00r.
Pages, Michel, to Societe des Usines Chimiques. Apparatus for the treatment of a liquid particularly reverse osmosis. 3,820,661, Cl. 210-321.000.
Pai, Venkatrao Krishnaraya; Hyman, Daniel; and Witheford, John Maurice, to American Cyanamid Company. Process for the production of methyl methacrylate. 3,821,286, Cl. 260-486.00r.
Paice, Derek A.: *See—*
Kimmel, Donald S.; and Paice, Derek A., 3,821,635.
Pakhomov, Vladimir Alexandrovich: *See—*
Chernyshev, Petr Sergeevich; Spiridonov, Konstantin Alexeevich; Pakhomov, Vladimir Alexandrovich; Nikolaev, Georgy Vasilievich; Volfson, Izrail Mordukhovich; Levchenko, Boris Leonidovich; Ryzhkov, Viktor Kuzmich; Gladkovsky, Petr Stanislavovich; Shargorodsy, Viktor Semenovich; and Shlyapin, Alexandr Nikolaevich, 3,820,915.
Palazzetti, Mario: *See—*
Salotti, Gianfranco; and Palazzetti, Mario, 3,820,855.
Paleologos, Constantin. Rotating internal combustion engine. 3,820,516, Cl. 123-8.470.
Palitex Project-Company GmbH: *See—*
Franzen, Gustav; and Veltges, Helmut, 3,820,315.
Palmer, Donnally W. Labyrinth game with changeable pattern. 3,820,793, Cl. 273-153.00r.
Palmer, William H.: *See—*
Platz, Gerald M.; Palmer, William H.; and Mauck, James W., 3,820,960.
Palsson, Jan Frederik: *See—*
Martensson, Kjell Halvard; Linde, Bjorn H:son; Palsson, Jan Frederik; and Jerre, Sven Torsten, 3,820,303.
Palyi, Leslie. Dehulling rape seed. 3,821,451, Cl. 426-483.000.
Pane, Joseph F.: *See—*
Doran, Robert J.; Grall, Robert W.; and Pane, Joseph F., 3,820,302.
Panetta, Dominic J. Straight edge file holder. 3,820,209, Cl. 29-80.000.
Pansy, Felix Edward: *See—*
Lee, Bong Kuk; Ryu, Dewey D. Y.; and Pansy, Felix Edward, 3,821,198.
Papst, Josef; deceased (by Papst, Stefanie); and Brockmuller, Brigitte. Non-return valve assembly. 3,820,561, Cl. 137-512.200.
Papst, Stefanie: *See—*
Papst, Josef; and Brockmuller, Brigitte, 3,820,561.
Paris, Gerard Yvon; and Swett, Leo Ralph, to Abbott Laboratories. 1,3-Dimethyl-4,5-di(p-substituted phenyl)-6H-pyrrolo(2,3-c)pyrazoles in treating inflammation. 3,821,391, Cl. 424-272.000.
Park-Ohio Industries, Inc.: *See—*
Snyder, James J.; and Schuckert, Frederick A., 3,821,037.
Parker, Clarence E. Interlocking modules for rapid construction of shelters and barriers. 3,820,294, Cl. 52-262.000.
Parker, Wilbur Allen; Bordt, Guillermo German; and Larsen, Holger, to CPC International Inc. Process for improving the flavor stability of peanut butter. 3,821,448, Cl. 426-397.000.
Parker-Hannifin Corporation: *See—*
Koski, Jerry V., 3,820,375.
Millar, James S.; and Henderson, Glenn W., 3,820,556.
Parlette, Joseph N., to Love, L. S., & Associates Limited. Dissolved air clarifier. 3,820,659, Cl. 210-195.000.
Parmenter, Robert W. Battery disconnector. 3,821,501, Cl. 200-155.00r.
Pasieka, John F.: *See—*
Kennedy, C. Bruce; and Pasieka, John F., 3,821,760.
Pasternak, Stephen F.; and Pasternak, Stephen F., Jr. Peerless of America, Incorporated Method of making a curved spined heat exchanger tube. 3,820,215, Cl. 29-157.30a.
Pasternak, Stephen F., Jr.: *See—*
Pasternak, Stephen F.; and Pasternak, Stephen F., Jr., 3,820,215.

Patchett, Arthur A.: *See—*
Arth, Glen E.; Sarett, Lewis H.; and Patchett, Arthur A., 3,821,374.

Patron, Luigi: *See—*
Melacini, Paolo; Patron, Luigi; Moretti, Alberto; and Tedesco, Raffaele, 3,821,178.

Patton, Bobbie J.: *See—*
Harrell, John W.; Patton, Bobbie J.; and Ballard, Billy G., 3,821,696.

Paul, Franklin O. Offset press fountain keys. 3,820,459, Cl. 101-365.000.

Pavlich, Joseph P.: *See—*
Motley, Herman R.; Morris, Earl F.; and Pavlich, Joseph P., 3,820,602.

Payrhammer, Bernd: *See—*
Frisch, Hans-Otto; and Payrhammer, Bernd, 3,820,803.

Peabody, Ralph C., to Tennant Company. Elongated hole brush. 3,820,186, Cl. 15-182.000.

Pearce, Jai K.: *See—*
Sieckman, Walter; Maurice, Harvey W.; and Pearce, Jai K., 3,820,768.

Pearce, Shairyl I.: *See—*
Allen, Thomas E.; and Pearce, Shairyl I., 3,820,417.

Pearne, Frank S.: *See—*
King, Terrance M.; and Pearne, Frank S., 3,820,631.

Pechous, Leslie J.: *See—*
Davis, James L.; Lopke, Edward L.; and Pechous, Leslie J., 3,821,562.

Pecjak, Edward. Container harness. 3,820,695, Cl. 224-45.0aa.

Peddinghaus, Carl Ullrich. Conveyor having thrust means movable in a series of discrete strokes and provided with an aboutment for engaging the rear end of an article to be fed to a predetermined position on the conveyor. 3,820,431, Cl. 83-251.000.

Pees, James M.: *See—*
Kerr, Lamar L.; Pees, James M.; and Riner, Robert J., 3,820,771.
Kerr, Lamar L.; Pees, James M.; and Riner, Robert J., 3,820,772.

Peilstocker, Gunter: *See—*
Dietzel, Karl; Peilstocker, Gunter; Meyer, Karl-Heinrich; and Streib, Hugo, 3,821,071.

Peltzer & Ehlers: *See—*
Koch, Friedrich-Karl; and Rahn, Oskar, 3,820,376.

Pendlington, Sidney: *See—*
Blake, Anthony; and Pendlington, Sidney, 3,821,435.

Pendrak, Johnny M., to Westinghouse Electric Corporation. Remote transformer monitoring system. 3,821,605, Cl. 317-14.00r.

Penick, Dixon Brown: *See—*
Hillman, Alfred Kimball, Jr.; Wochholz, Harold Frederick; and Penick, Dixon Brown, 3,821,478.

Penman, Melvin C. Fish cleaning device and method for filleting. 3,820,196, Cl. 17-46.000.

Pennsylvania Engineering Corporation: *See—*
Fisher, Howard M., 3,820,665.
Sieckman, Walter; Maurice, Harvey W.; and Pearce, Jai K., 3,820,768.

Pennwalt Corporation: *See—*
D'Angelo, Antonio Joseph, 3,821,273.
Huber, Ludwig Konrad, 3,821,210.

Peoples, Charles Frederick. Closed circuit domestic sewage treating method. 3,821,107, Cl. 210-12.000.

Perelberg, Azik Iosifovich: *See—*
Andreev, Oleg Semenovich; Birjukov, Boris Konstantinovich; Byzov, Yury Mikhailovich; Lekhtman, Moisei Abramovich; Perelberg, Azik Iosifovich; Strimbling, Semen Itskhovich; Trachevsky, Boris Sergeevich; Fikhman, Isak Berovich; Cherepakha, Pavel Andreevich; nd Shraifeld, Tamara Yakovlevna, 3,821,749.

Perkin-Elmer Corporation, The: *See—*
Scott, Roderic M., 3,821,763.

Perry, Clifton C., to Magnavox Company, The. Automatic tint circuit for flesh tone correction. 3,821,790, Cl. 358-28.000.

Pessolano, Arsenio A.; Witzel, Bruce E.; Graham, Patricia M.; Clark, Robert L.; and Shen, Tsung-Ying, to Merck & Co., Inc. Dibenzo(C,E)azepin-5-ones. 3,821,201, Cl. 260-239.30t.

Peter, Richard; Angliker, Hans-Joerg; and Artz, Klaus, to Ciba-Geigy AG. Water-insoluble monoazo dyestuffs. 3,821,194, Cl. 260-207.000.

Peterli, Hans-Jakob: *See—*
Brunetti, Heimo; Peterli, Hans-Jakob; Muller, Helmut; and Heller, Hansjorg, 3,821,310.

Peters, Bruce C.: *See—*
Cheng, Chin Huan; and Peters, Bruce C., 3,820,958.

Peters, Cal F. Waitress call system for cocktail lounge, restaurant, or the like. 3,821,707, Cl. 340-171.00r.

Peters, Donald L., to Pjillips Petroleum Company. Method for blow molding articles having a plurality of openings. 3,821,344, Cl. 264-94.000.

Peters, Edwin F., to Owens-Illinois, Inc. Transistor control apparatus. 3,821,599, Cl. 315-169.0tv.

Peters, Frederick D.: *See—*
Copeland, Richard S.; and Peters, Frederick D., 3,821,065.

Peterson, Gerald Wallace. Vehicle for playing a ball game. 3,820,790, Cl. 273-129.000.

Petke, Frederick E., to Borden, Inc. Pigmented polymeric resin castings. 3,821,138, Cl. 260-23.00r.

Petre, James Gusten Ragnar, to SKF Industrial Trading and Development Company B.V. Cage for a rolling bearing and method of making it. 3,820,864, Cl. 308-201.000.

Petrie, Adelore F.; and Schreier, Wilford R., to Hammond Corporation. Pulse generator for use with an electrical musical instrument. 3,821,457, Cl. 84-1.010.

Petrolite Corporation: *See—*
Redmore, Derek, 3,821,232.

Petty, William D., to Owens-Illinois, Inc. Method and apparatus for operating gaseous discharge display/memory panels in saturation mode. 3,821,597, Cl. 315-169.0tv.

Pfeifer, Ferdinand: *See—*
Fenger, Horst; and Pfeifer, Ferdinand, 3,820,598.

Pfiffner, Albert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,821,284.

Pfister, Jurg R.; Harrison, Ian T.; and Fried, Jean H., to Syntex(U.S.A.) Inc. Disubstituted xanthone carboxylic acid compounds. 3,821,251, Cl. 260-335.000.

Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., to Syntex (U.S.A.) Inc. 6-Acyl-xanthone-2-carboxylic acids. 3,821,252, Cl. 260-335.000.

Pfizer Inc.: *See—*
Richards, Hugh Colin, 3,821,228.

Phelon, R. E., Company, Inc.: *See—*
Burson, Bob O., 3,821,570.

Phelps Dodge Industries, Inc.: *See—*
Bahder, George; and Katz, Carlos, 3,821,640.

Philco-Ford Corporation: *See—*
Goldman, Richard L., 3,820,235.

Philips Petroleum Company: *See—*
Gilbert, Dixie E., 3,821,345.

Phillips, Carroll D. Barbecue grill cleaning device. 3,820,185, Cl. 15-105.000.

Phillips, David C.: *See—*
Szedon, John R.; Jackson, John A.; and Phillips, David C., 3,821,099.

Phillips Petroleum: *See—*
Schirmer, Robert M.; and Fromm, Ellsworth H., 3,820,320.

Phillips Petroleum Company: *See—*
Bertus, Brent J., 3,821,324.
Campbell, Robert W.; and Marrs, Oren L., 3,821,072.
Cooper, Earl D.; and Hall, Dick S., 3,821,185.
Cornell, William H.; and Siedenstrang, Roy W., 3,821,152.
Cywinski, Norbert F., 3,821,298.
Dix, James S.; Mathis, Ronald D.; and Underwood, John H., 3,821,142.
Doss, Richard, 3,821,166.
Johnson, Robert F., 3,820,949.
Mathis, Ronald D., 3,821,141.
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Rees, Robert L.; and Williams, George E., 3,821,022.
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Pickering, Edgar, (Blackburn) Limited: *See—*
Woodcock, Douglas George, 3,820,482.

Pickford Mills, Inc.: *See—*
Hanson, William D.; and Hanson, Carl H., 3,820,359.

Pierres Holding SA: *See—*
Steffen, Jurg; and Lortscher, Hans-Peter, 3,821,661.

Pietenpol, William J., to Bell & Howell Company. Card return mechanism. 3,821,519, Cl. 235-61.11d.

Pietrantuone, Anthony J.: *See—*
Lin, Ruey Y.; Murty, Hari N.; and Pietrantuone, Anthony J., 3,821,074.

Piffath, Rodney S.; and Cole, John J., to International Fire Tool Corporation. Lighter construction. 3,820,941, Cl. 431-254.000.

Pike, John E.: *See—*
Beal, Philip F., III; and Pike, John E., 3,821,280.
Lincoln, Frank H., Jr.; and Pike, John E., 3,821,291.

Pinzone, Salvatore M.: *See—*
Jolly, Michael P.; Quellette, Norman P.; Vitti, Rudolf A.; and Pinzone, Salvatore M., 3,821,429.

Pioneer Electronic Corporation: *See—*
Maruyama, Yoshio, 3,821,810.
Tamura, Masahiko; Iwama, Kiyonori; Yamaguchi, Akira; and Asahina, Mitsuo, 3,821,492.
Wada, Eiichi; and Ono, Yoshio, 3,821,808.

Pitney-Bowes, Inc.: *See—*
Braca, Joseph F.; and Hynes, John E., 3,821,060.

Pitt, Bruce R.; and Wolf, John W., to Globe Tool and Engineering Company, The. Stator winding method and apparatus. 3,820,728, Cl. 242-1.10r.

Pittman, Walter Elwood: *See—*
Culhane, Gerald John; Layton, Gary Richard; and Pittman, Walter Elwood, 3,821,002.

Piven, Grigory Antonovich; Khodich, Nikifor Karpovich; Gapshenko, Alexei Lavrentievich; and Fursov, Nikolai Nikolaevich. Method for the production of multilayer metal blanks. 3,820,585, Cl. 174-94.000.

Pizzo, James J.; and Eliott, William W., to FMC Corporation. Automobile shipping container unloader. 3,820,670, Cl. 214-16.1db.

Pjillips Petroleum Company: *See—*
Peters, Donald L., 3,821,344.

Planz, Paul E., to Standard Oil Company, The. Process for recovering nitrile polymer solids from latex. 3,821,348, Cl. 264-182.000.

Platt, Jeremy A.: *See—*
Baird, William G., Jr.; Holbrook, Stanley E.; and Platt, Jeremy A., 3,821,182.

Platz, Gerald M.; Palmer, William H.; and Mauck, James W., to National Distillers and Chemical Corporation. Stirrer for polymerization reactor. 3,820,960, Cl. 23-285.000.

Platz, Rolf: *See—*
Bressel, Ulrich; Fuchs, Werner; and Platz, Rolf, 3,821,287.

Plempel, Manfred: *See—*
Boshagen, Horst; and Plempel, Manfred, 3,821,385.
Timmler, Helmut; Draber, Wilfried; Buchel, Karl Heinz; and Plempel, Manfred, 3,821,394.

Plockinger, Erwin; and Kuhnelt, Gert, to Gebr, Bohler & Co. Apparatus for making metal ingots. 3,820,587, Cl. 164-252.000.

Plows, Graham Stuart; and Edge, Gordon Malcolm, to Decco Limited. Method and apparatus for making master records for disc records by scanning thermoplastic film with electron beam. 3,821,488, Cl. 179-100.40c.

Plummer, William T., to Polaroid Corporation. Light seal for a reflex camera viewfinder. 3,821,767, Cl. 354-42.000.

Pocock, Walter E., to United States of America, Navy. Method of reducing solid arcing product build-up between electrical contacts in pressurized fluid ambients. 3,821,530, Cl. 200-249.000.

Podesva, Ctirad; and Do Nascimento, Jose'Maria, to Delmar Chemicals Limited. 1,2,3,6-Tetrahydropyrimidine-2-one compounds and processes for making them. 3,821,221, Cl. 260-251.00r.

Poe, Lloyd Richard, to Hartwell Corporation. Shock resisting energy absorbing device. 3,820,634, Cl. 188-1.00c.

Poetsch, Eike: *See—*
Koppe, Volker; Schulte, Karl; Borck, Joachim; Poetsch, Eike; and Muller-Calgan, Helmut, 3,821,234.

Pohle, Werner P., to Spray Engineering Company. Flushable nozzle having means for redirecting and dispersing the effluent. 3,820,717, Cl. 239-107.000.

Poignant, Jean-Claude: *See—*
Malen, Charles; Danree, Bernard; and Poignant, Jean-Claude, 3,821,249.

Poignant, Pierre: *See—*
Guillot, Jean Claude; Poignant, Pierre; and De Lesseux, de Bazelaire Jacques, 3,821,239.

Poincenot, Rene, to Societe Anonyme dite: Ratier-Forest. Machining center with automatic tool-changer. 3,820,234, Cl. 19-568.000.

Poje, Albert J.; and Newallis, Peter E., to Chemagro Corporation. Method for controlling plant growth with substituted cyclohexenones. 3,820,975, Cl. 71-98.000.

Poland, David R.: *See—*
Van Deventer, Arthur J.; and Poland, David R., 3,820,383.

Polaroid Corporation: *See—*
Bullock, Edward K., 3,820,457.
Gold, Nicholas, 3,821,049.
Huyffer, Paul S.; and Wasatonic, John J., 3,821,254.
Johnson, Bruce K.; and Reynard, John M., 3,821,771.
Kennedy, C. Bruce; and Pasieka, John F., 3,821,760.
Land, Edwin H.; Bloom, Stanley M.; and Farney, Leonard C., 3,821,000.
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Scarpetti, Julius J., 3,820,874.
Shelton, William A., 3,821,764.
Shenk, Edwin K., 3,821,547.

Polese, James P., to Varian Associates. Method of making an electron tube having an improved filamentary cathode and support therefor. 3,820,206, Cl. 29-25.150.

Poletaeva, Irina Alexandrovna: *See—*
Jufa, Tatyana Lvovna; Poletaeva, Irina Alexandrovna; Kormer, Vitaly Abramovich; Babitsky, Boris Davydovich; Lobach, Mark Iosifovich; Markova, Viktoria Vladimirovna; and Churlyaeva, Lidia Alexandrovna, 3,821,181.

Pollard, Frederick J. Dual polarized antenna with triangular wire reflector. 3,821,742, Cl. 343-727.000.

Pollitzer, Ernest L.: *See—*
Germanas, Dalia; and Pollitzer, Ernest L., 3,821,123.

Pollock, James Richard Allan, to Dixon Malt Company Limited, The and Enjymic Malt Company Limited, The. Intermediates in brewing. 3,821,419, Cl. 426-29.000.

Polymers, Inc.: *See—*
Shaw, Gilbert; and Anderson, Charles H., Jr. (Shaw, Cloria E.; executrix assor. to said), 3,820,653.

Pond, Chester C.: *See—*
Bobb, Lloyd J., 3,821,490.

Pond, John E. Radiation and convection heated oven. 3,820,525, Cl. 126-21.00a.

Ponemone, Seymour J.: *See—*
Lindberg, Frank A.; Ponemone, Seymour J.; Konsowski, Stephen G.; and Shamash, Maurice B., 3,820,994.

Popper, Jakhin Boaz; and Ashkenazi, Arie, to State of Isreal, Ministry of Defence, The. Mechanical coupling means. 3,820,199, Cl. 24-218.000.

Porret, Daniel: *See—*
Garratt, Peter Garth; Habermeier, Juergen; Porret, Daniel; and Zuppinger, Paul, 3,821,098.
Habermeier, Juergen; Batzer, Hans; and Porret, Daniel, 3,821,242.
Habermeier, Juergen; and Porret, Daniel, 3,821,243.

Portoulas, Peter G., to Ecos Electronics Corporation. Resistance level detector. 3,821,641, Cl. 324-62.000.

Powell, Barry K., to Bendix Corporation, The. Model referenced speed control for automobiles. 3,820,622, Cl. 180-98.000.

Powell, Richard James, to Du Pont de Nemours, E. I., and Company. Ionic ethylene copolymers containing slip/block additives. 3,821,179, Cl. 260-88.10r.

Powers, William T., to Aladdin Industries, Incorporated. Board game. 3,820,791, Cl. 273-131.00b.

PPG Industries, Inc.: *See—*
Doran, Thomas J., Jr.; and Stevens, Henry C., 3,821,133.

Pratt, Henry L., III: *See—*
Roberts, Thomas G.; Rust, Charles M.; Rogers, Billie O.; Pratt, Henry L., III; and Morgan, Robert L., 3,820,562.

Prefection Manufacturing Company, The: *See—*
Hoffmann, Ralph L., 3,820,313.

Presto Lock Co.; Division of Kidde, Walter, & Company, Inc.: *See—*
Bako, Lazlo; and Heine, Henry, 3,820,363.

Preud'Homme, Jean: *See—*
Mancy, Denise; Ninet, Leon; and Preud'Homme, Jean, 3,821,366.

Price Brothers Company: *See—*
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Springer, Lamar D.; Mullendore, David L.; and Marcum, Alfred L., Jr., 3,820,729.

Price, John G.: *See—*
Erickson, Fred W.; and Price, John G., 3,821,727.

Priebs, Horst; and Hecker, Alfred, to Anker-Werke AG. Recorder head for compound alphanumeric characters and code characters. 3,820,643, Cl. 197-1.00r.

Priest, David Charles; Sandner, Michael Ray; and Trecker, David John, to Union Carbide Corporation. Beta-amino carbonyl catalysts for polyurethane preparation. 3,821,131, Cl. 260-2.5ac.

Priest, Melvin E., to Deere & Company. Plant thinner having radiant energy plant detecting means. 3,821,550, Cl. 250-226.000.

Princeton Polymer Laboratories, Inc.: *See—*
Hudgin, Donald Edward; and Blair, Edgar Allan, 3,821,136.

Pringle, William L.: *See—*
Bateson, Norman E.; and Pringle, William L., 3,820,747.

Procter & Gamble Company, The: *See—*
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Production Technology Inc., mesne: *See—*
Sage, Ira H., 3,820,231.

Prophet, Larry D.: *See—*
Cline, Banjamin W.; and Prophet, Larry D., 3,820,806.

Przybylek, George J., to Burroughs Corporation. Display panel having flat side edges to permit butting together plural panels. 3,821,588, Cl. 313-220.000.

Pullman Incorporated: *See—*
Bateson, Norman E.; and Pringle, William L., 3,820,747.
McNally, George S., 3,820,473.
Snook, Randolph W., 3,820,228.

Purtov, Ivan Nikolaevich; Trofimov, Nikolai Filippovich; and Zhdanov, Makhmut Mukhametovich. Spray-type heat exchanger. 3,820,765, Cl. 261-103.000.

Putzig, Donald Edward, to Du Pont de Nemours, E. I., and Company. Synthesis of cyanoazo dyes. 3,821,195, Cl. 260-206.000.

Quellette, Norman P.: *See—*
Jolly, Michael P.; Quellette, Norman P.; Vitti, Rudolf A.; and Pinzone, Salvatore M., 3,821,429.

Quesinberry, Elmen C.; Glover, Clarence C.; and Van Hook, Brewton O., to Westinghouse Electric Corporation. Antenna positioning system and method. 3,821,738, Cl. 343-7.400.

Questi, Charles J., Jr.: *See—*
Questi, Charles, Sr.; Kadlec, Jerry T.; and Questi, Charles J., Jr., 3,820,763.

Questi, Charles, Sr.; Kadlec, Jerry T.; and Questi, Charles J., Jr. Portable cement mixer. 3,820,763, Cl. 259-178.00r.

Quirijnen, Marius, to U.S. Philips Corporation. Paper stacker. 3,820,700, Cl. 226-74.000.

Raabe, Ralph Christian, Jr.: *See—*
Meserve, Forrest Clayton; and Raabe, Ralph Christian, Jr., 3,820,580.

Radlmann, Eduard: *See—*
Arend, Gunter; Radlmann, Eduard; and Nischk, Gunther, 3,821,176.

Radlmann, Eduard; and Nischk, Gunther, to Bayer Aktiengesellschaft. Sulfonato-benzyl-malonic acid esters. 3,821,281, Cl. 260-470.000.

Rae, Albert Thomas. Fishing lure. 3,820,269, Cl. 43-42.050.

Rahn, Oskar: *See—*
Koch, Friedrich-Karl; and Rahn, Oskar, 3,820,376.

Rakcevic, Savo, to Titovi Zovodi Litostroj. Safety device for preventing the excessive speed of water turbines. 3,820,917, Cl. 416-157.000.

Raleigh, Douglas O.: *See—*
Topol, Leo E.; and Raleigh, Douglas O., 3,821,090.

Ralston Purina Company: *See—*
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Ranadive, Deepak K.: *See—*
Tan, Yen T.; Khosla, Rajinder P.; Fischer, John R.; and Ranadive, Deepak K., 3,820,988.

Ranco Incorporated: *See—*
Demaray, Merlin E., 3,820,713.

Rangger, Herbert, to Hilti Aktiengesellschaft. Explosive powder-driven tool for setting anchoring members. 3,820,703, Cl. 227-10.000.

Rao, Vaddadi Siva Bhaskar; Gopinath, Kottil Wallapil; and Iyengar, Madhur Srinivas, to Council of Scientific and Industrial Research. Improvements in or relating to the manufacture of cyclohexanone oxime from cyclohexanone. 3,821,303, Cl. 260-566.00a.

Rappaneau, Wilfred L.: *See—*
Jasovsky, George A.; Rappaneau, Wilfred L.; DeCeglie, Gaetano J.; and Nacci, Anthony T., 3,821,447.

Rappleyea, Frederick A., to Cougar, Inc. Football helmet having sectional liner of energy absorbing material. 3,820,163, Cl. 2-3.00r.

Raschle, Josef, to Heberlien & Co. AG. Friction false-twist device. 3,820,317, Cl. 57-77.400.

Rasmussen, Carl E.; and Tiura, George O., to Agmac Inc. Pepper station. 3,820,450, Cl. 99-643.000.

Rasmussen, Chris Royce, to McNeil Laboratories, Inc. 3,4-Dihydro-1-methyl-11H-1,4-oxazino(4,3-b)-1,2-benzothiazin-11-one 6,6-dioxide. 3,821,212, Cl. 260-243.00r.

Ratcliff, Larry P., to United States of America, National Aeronautics and Space Administration. Latch mechanism. 3,820,741, Cl. 244-1.0sd.

Rauch, Francis Clyde; and Nachtigall, Guenter Willi, to American Cyanamid Company. Catalytic hydration of nitriles to produce amides. 3,821,300, Cl. 260-561.00n.

Rausch, Richard E.: *See—*
Mitsche, Roy T.; Hayes, John C.; Wilhelm, Frederick C.; and Rausch, Richard E., 3,821,105.

Raybestos-Manhattan, Inc.: *See—*
D'Olier, George, 3,821,063.

Raymond, Robert J., to Thermo Electron Corporation. Variable cut-off intake valve system. 3,820,442, Cl. 91-259.000.

Raynaud, Guy M.: *See—*
Fauran, Claude P.; Douzon, Colette; Raynaud, Guy M.; and Sergant, Micheline Y., 3,821,215.

Raytheon Company: *See—*
Bickford, William J.; Rowland, Howard J.; and Tsao, Carson K. H., 3,821,646.
Ehrlich, Stanley L., 3,821,740.
Graham, Cleve A., 3,821,689.

Razin, Anatoly Alexandrovich: *See—*
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RCA Corporation: *See—*
Ettenberg, Michael, 3,821,039.
Gordon, Franklin; and Andrews, Dallas Roy, 3,821,814.
Katagi, Kazuo; Ross, Walter Lee; and Lyon, John Jeffrey, 3,821,728.
Shelby, James Henry; and Richter, Fred Eric, 3,821,617.

Reardon, Joseph Edward, to Du Pont de Nemours, E. I., and Company. Method of bonding hydroxyl containing substrates. 3,821,056, Cl. 156-331.000.

Reber, Walter. Hay-making machine. 3,820,314, Cl. 56-370.000.

Redington, Rowland W.; and Henkes, John L., Jr., to General Electric Company. Screen for producing an enhanced impression of depth. 3,820,873, Cl. 350-125.000.

Redmore, Derek, to Petrolite Corporation. 1,2-Dihydro-pyridine-N-phosphonates and thiophosphonates. 3,821,232, Cl. 260-294.80k.

Reed, Winslow W.: *See—*
Gendron, Wilfred H.; and Reed, Winslow W., 3,820,447.

Reehil, Edward G., to Xerox Corporation. Elevator assembly positioning control. 3,820,777, Cl. 271-155.000.

Rees, Robert L.; and Williams, George E., to Phillips Petroleum Company. Intumescent coated crosslinked polyolefins. 3,821,022, Cl. 117-137.000.

Reeve, Brian Eldred. Process for the preparation of an instant tea powder. 3,821,440, Cl. 426-312.000.

Reeve, Paul H., to Auto Research Corporation. Track lubrication for tracked vehicle, in particular snowmobiles. 3,820,858, Cl. 305-14.000.

Reeves, Robert C.; Mansky, Michael; Stavropoulos, Napoleon; Kaleda, William W.; and Richards, William J., to General Foods Corporation. Coffee product and process. 3,821,430, Cl. 426-147.000.

Regie Nationale des Usines Renault: *See—*
Henault, Claude, 3,820,327.

Regnier, Gilbert; Canevari, Roger; and Suhault, Jacques, to Science Union et Cie. Pyridyl piperazines. 3,821,225, Cl. 260-268.00h.

Reif, Werner: *See—*
Koenig, Horst; Metzger, Horst; and Reif, Werner, 3,821,277.

Reiff, Helmut, to Bayer Aktiengesellschaft. 2-Alkyl-2-mercaptomethyl-1,3-propane diols. 3,821,313, Cl. 260-609.00r.

Reimer, William A., to GTE Automatic Electric Laboratories Incorporated. Wire terminal. 3,821,691, Cl. 339-75.00r.

Reinecke, Gunter; and Linke, Dietrich, to Benz & Hilgers GmbH, mesne. Method of and machine for producing sterile packages. 3,820,300, Cl. 53-29.000.

Reisman, Howard. Tubular carton. 3,820,685, Cl. 206-508.000.

Reiss, Martin H.; and Adams, James R., to Gulf & Western Manufacturing Company (Systems). Alarm circuitry. 3,821,733, Cl. 340-409.000.

Rekai, Andre, to Honeywell Inc. System for providing a linear output from a non-linear condition responsive device. 3,820,398, Cl. 73-336.500.

Reliable Electric Company: *See—*
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Relles, Howard M.; and Schluenz, Robert W., to General Electric Company. Film forming chlorinated polyimide-ethers and method for making same. 3,821,164, Cl. 260-47.0cz.

Remy, Hermann, to Rowenta Werke GmbH. Gas lighters. 3,820,942, Cl. 431-255.000.

Renard, Guy: *See—*
Barbier, Jean France L. P.; and Renard, Guy, 3,820,998.

Renckhoff, Gustav: *See—*
Hulsmann, Hans Leo; and Renckhoff, Gustav, 3,821,292.

Renner, Hermann: *See—*
Breitschwerdt, Werner; and Renner, Hermann, 3,820,621.

Replogle, Robert W.; Clark, Earl D.; Goldenetz, Robert A.; and English, Eugene E., to Ohio Art Company. Toy cap revolver. 3,820,267, Cl. 42-58.000.

Republic Steel Corporation: *See—*
Thomas, Jerry D.; and Griffith, Cecil B., 3,820,982.

Research Corporation: *See—*
Bostick, William Derry; and Carr, Peter William, 3,821,643.

Resnick, Paul Raphael, to Du Pont de Nemours, E. I., and Company. Purification of perfluorosulfonyl fluoride perfluorovinyl ethers by thermal decomposition of unstable isomers. 3,821,297, Cl. 260-543.00f.

Reuchlein, Gunter, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Double-acting gas multi-cylinder external combustion engine. 3,820,331, Cl. 60-525.000.

Revenue Systems Limited: *See—*
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Rex Chainbelt Inc.: *See—*
Mueller, Edwin R., 3,820,558.

Reynard, John M.: *See—*
Johnson, Bruce K.; and Reynard, John M., 3,821,771.

Reynolds, Beverly L., to Cybersol, Inc. Therapeutic composition. 3,821,368, Cl. 424-128.000.

Reynolds Metals Company: *See—*
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Reynolds, R. J., Tobacco Company: *See—*
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Reyrolle Parsons Limited: *See—*
Neasham, David Lynn; and Wright, William Frederick, 3,821,633.

Rheinstahl Aktiengesellschaft: *See—*
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Rhine, Samuel: *See—*
Showalter, Merle Robert; and Rhine, Samuel, 3,820,523.

Rhone-Poulenc S.A.: *See—*
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Fouche, Jean; and Leger, Andre, 3,821,197.
Mancy, Denise; Ninet, Leon; and Preud'Homme, Jean, 3,821,366.
Milbert, Gerard, 3,821,140.

Rhone-Poulenc-Textile: *See—*
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Rhone-Progil: *See—*
Guillot, Jean Claude; Poignant, Pierre; and De Lesseux, de Bazelaire Jacques, 3,821,239.

Rhudy, John S.: *See—*
Knight, Bruce L.; Rhudy, John S.; and Fullenwider, James H., 3,820,603.

Rice, M. Lee: *See—*
Scurlock, Arch; Rumbel, Keith E.; and Rice, M. Lee, 3,821,041.

Richard, Roger; and Brugger, Robert Eugene. Leaching chamber. 3,820,341, Cl. 61-13.000.

Richards, Hugh Colin, to Pfizer Inc. 2-Aminoalkyl tetrahydroquinolines. 3,821,228, Cl. 260-288.00r.

Richards, William J.: *See—*
Reeves, Robert C.; Mansky, Michael; Stavropoulos, Napoleon; Kaleda, William W.; and Richards, William J., 3,821,430.

Richter, Albert P., Jr.; and McEvers, William R., Jr., to Texaco Inc. Method and apparatuses for transmission of data from drill bit in well while drilling. 3,820,389, Cl. 73-151.000.

Richter, Fred Eric: *See—*
Shelby, James Henry; and Richter, Fred Eric, 3,821,617.

Richter, Sven U.K.A., to Sanitized, Incorporated. Bioactive sulfones. 3,821,399, Cl. 424-304.000.

Ricoh Co., Ltd.: *See—*
Kato, Saburo, 3,821,812.
Kurakawa, Junji; and Soga, Setsuo, 3,820,891.

Riehle, Harald, to IWA-Rechenschieberfabrik F. Riehle KG. Computing, or calculating device. 3,821,521, Cl. 235-119.000.

Riess, Walter: *See—*
Wilhelm, Max; and Riess, Walter, 3,821,214.

Rieter Machine Works, Ltd.: *See—*
Graf, Felix, 3,820,739.

Rigal, Jean, to Creusot-Loire. Rotating agitator for a cylindrical receptacle of great length. 3,820,761, Cl. 259-109.000.

Rigassi, Norbert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,821,284.

Rikagaku Kenkyusho: *See—*
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Yoshida, Ryonosuke; Saito, Tadaomi; and Shimizu, Akira, 3,821,403.

Rikman, Mikhail Abramovich; and Ioffe, Felix Semenovich. Device for the transportation of loads between operations. 3,820,469, Cl. 104-96.000.
Riner, Robert J.: *See—*
Kerr, Lamar L.; Pees, James M.; and Riner, Robert J., 3,820,771.
Kerr, Lamar L.; Pees, James M.; and Riner, Robert J., 3,820,772.
Riordan, Richard C.: *See—*
Rule, Norman Geoffrey; and Riordan, Richard C., 3,820,989.
Ripple, David Eugene, to Lubrizol Corporation, The. Certain 2-halo-1,2,4-thiadiozole disulfides. 3,821,236, Cl. 260-302.0sd.
Ritland, Paul D.; and Ache, Rollin W., to Westinghouse Electric Corporation. Tube support system for heat exchanger. 3,820,594, Cl. 165-69.000.
Riverside Press, Inc.: *See—*
O'Neal, Cothburn M., 3,821,522.
Rivin, Evgeny Izrailevich; and Lapin, Jury Emanuilovich. Cantilever tool mandrel. 3,820,422, Cl. 82-36.00r.
Robacks Medaniska Verkstad Bostrom & Soner: *See—*
Bostrom, Sture; and Nordstrom, Gert, 3,820,762.
Robbins Incubator Co.: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Hausske, Gene W.; Huston, Kenneth G.; Rosenberg, Bernard L.; and Smith, Shirley M., 3,820,507.
Roberts, Charles B., to Dow Chemical Company, The. Stabilization of aluminum hydride. 3,821,044, Cl. 423-275.000.
Roberts, George Leathwhite, Jr.: *See—*
Lewis, Joseph Earle, Jr.; and Roberts, George Leathwhite, Jr., 3,821,359.
Roberts, Howard M. Guitar instruction system. 3,820,434, Cl. 84-485.000.
Roberts, John H.: *See—*
Kliewer, George G.; Roberts, John H.; and Gee, Glen R., 3,820,499.
Roberts, John J.: *See—*
Webb, Robert F.; and Roberts, John J., 3,821,594.
Roberts, Thomas G.; Rust, Charles M.; Rogers, Billie O.; Pratt, Henry L., III; and Morgan, Robert L., to United States of America, Army. Continuous liquid chemical injector. 3,820,562, Cl. 137-209.000.
Robertshaw Controls Company: *See—*
Demi, Roy C., 3,820,563.
Robertson, John R.: *See—*
Mao, Chung-Ling; Bakker, Lynn A.; and Robertson, John R., 3,821,132.
Robertson Paper Box Co. Inc.: *See—*
Tyrseck, Walter J., 3,820,686.
Robins, A. H., Company, Inc.: *See—*
Welstead, William J., Jr., 3,821,387.
Robinson, Donald E., to Scott, O. M., & Sons Company, The. Grass Catcher. 3,820,312, Cl. 56-202.000.
Robinson, John R. Drinking arrangement for a horse. 3,820,508, Cl. 119-73.000.
Robinson, Neil L.: *See—*
Abbott, Chester D.; Brock, George W.; Robinson, Neil L.; Shelledy, Frank B.; and Smith, Sidney H., 3,821,815.
Robinson, Richard C.: *See—*
Hughes, Thomas R.; Jacobson, Robert L.; and Robinson, Richard C., 3,821,104.
Roch, Gerald V., to Hurco Manufacturing Company. Gauging apparatus for presses and the like. 3,820,377, Cl. 72-461.000.
Rocket Racing Products: *See—*
Longo, Isadore S.; and Watson, James J., 3,820,851.
Rockwell International Corporation: *See—*
Michael, Harold J., 3,821,019.
Topol, Leo E.; and Raleigh, Douglas O., 3,821,090.
Rockwell Manufacturing Company: *See—*
McCaskill, John Walton, III, 3,820,599.
Rodger, David B.: *See—*
Boto, Louis; and Rodger, David B., 3,820,947.
Roederer, Willis A. Spooled wire reel and handling device therefor. 3,820,733, Cl. 242-94.000.
Roese, John A. Liquid crystal stereoscopic television system. 3,821,466, Cl. 178-6.500.
Roess, Dieter, to Siemens Aktiengesellschaft. System for the optical monitoring of air pollutants in a large space. 3,820,897, Cl. 356-75.000.
Rogemont, Jean: *See—*
Abbes, Claud; Bianchi, Santos; Chevallereau, Roger; Rogemont, Jean; Roques, Robert; Rouaud, Christian; and Royer, Henri, 3,820,799.
Rogers, Benjamin T.; Taylor, Roger W.; and Venable, Douglas, to United States of America, Atomic Energy Commission. Confinement system for high explosive events. 3,820,435, Cl. 89-1.00r.
Rogers, Billie O.: *See—*
Roberts, Thomas G.; Rust, Charles M.; Rogers, Billie O.; Pratt, Henry L., III; and Morgan, Robert L., 3,820,562.
Rogers, Frederick: *See—*
Bradus, Robert; Bruder, Edward A.; and Rogers, Frederick, 3,820,485.
Rogers, William P. Surgical method for sterilization. 3,820,528, Cl. 128-1.00r.
Rogovin, Zakhar Alexandrovich: *See—*
Lishevskaya, Marina Osipovna; Virnik, Alexandr Davidovich; Gabrielian, Genrikh Aramaisovich; Rogovin, Zakhar Alexandrovich; Borbat, Vladimir Fedorovich; Orlov, Alexandr Mikhailovich; Ferberg, Mirriam Borisovna; and Markelova, Nina Ivanovna, 3,821,137.
Rohm & Haas Company: *See—*
Bayer, Horst O.; Cook, Richard S.; and Von Meyer, William C., 3,821,376.
Rohr, Harry: *See—*
Muller, Karl-Heinz; Rohr, Harry; and Ott, Karl-Heinz, 3,821,157.
Rohr, Otto: *See—*
Janiak, Stefan; and Rohr, Otto, 3,821,393.
Rohr, Otto, to Ciba-Geigy Corporation. Iodoethyl esters of aromatic carboxylic acids. 3,821,285, Cl. 260-476.00r.
Rolair Systems, Inc.: *See—*
Burdick, Robert E., 3,820,467.
Rolatape Corporation: *See—*
Evans, Wallace D., Jr., 3,820,246.
Rolls-Royce (1971) Limited: *See—*
Clark, Kenneth William, 3,820,719.
Roman, Walter G., to Westinghouse Electric Corporation. Space vehicle. 3,820,325, Cl. 60-203.000.
Rombusch, Konrad: *See—*
Ruter, Jorn; Magosch, Karl-Heinz; Rombusch, Konrad; and Eichers, Ursula, 3,821,184.
Romney, Russell H. Apparatus and method for producing, commutating and transmitting optical and electronic signals. 3,821,732, Cl. 340-380.000.
Ronnholm, Arvi, to Oy W. Rosenlew AB. Device for evaporation of liquids. 3,820,582, Cl. 159-18.000.
Roques, Robert: *See—*
Abbes, Claud; Bianchi, Santos; Chevallereau, Roger; Rogemont, Jean; Roques, Robert; Rouaud, Christian; and Royer, Henri, 3,820,799.
Rorer, William H., Inc.: *See—*
Diamond, Julius; and Santora, Norman Julian, 3,821,267.
Diamond, Julius; and Santora, Norman Julian, 3,821,268.
Diamond, Julius, 3,821,289.
Diamond, Julius; and Novick, William J., Jr., 3,821,406.
Rosati, David E.: *See—*
Maver, William J.; and Rosati, David E., 3,821,626.
Rose, Ralph Edward, to Signetics Corporation. Semiconductor structure with bumps. 3,821,785, Cl. 357-67.000.
Roselli, Sergio, to Saint Gobain Industries. Method and apparatus for turning vehicle lights on and off. 3,821,593, Cl. 315-82.000.
Rosen, Karl Isac Joel. Thread supply device for textile machines. 3,820,731, Cl. 242-47.120.
Rosenberg, Bernard L.: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Hausske, Gene W.; Huston, Kenneth G.; Rosenberg, Bernard L.; and Smith, Shirley M., 3,820,507.
Rosenstein, William; and Oliva, Fred P., to Addressograph-Multigraph Corporation. Composite photocomposing type disc. 3,821,770, Cl. 354-292.000.
Ross, Hubert M., Jr.: *See—*
Leonard, Guy W.; and Ross, Hubert M., Jr., 3,820,463.
Ross, Lee E. Automobile deceleration indicating device. 3,821,701, Cl. 340-71.000.
Ross, Walter Lee: *See—*
Katagi, Kazuo; Ross, Walter Lee; and Lyon, John Jeffrey, 3,821,728.
Ross, Will, Inc.: *See—*
Wise, Lewis Abraham; and Grimm, John E., 3,820,959.
Rosso, John B., to Combustion Engineering, Inc. Seal. 3,820,400, Cl. 73-398.00r.
Rotenberg, Don H.: *See—*
Goodwin, Bertram R.; and Rotenberg, Don H., 3,821,333.
Roth, Eric Michael. Brush adaptor for vacuuming. 3,820,189, Cl. 15-400.000.
Roth, Stanley M.: *See—*
Hayes, David F.; and Roth, Stanley M., 3,821,516.
Rouaud, Christian: *See—*
Abbes, Claud; Bianchi, Santos; Chevallereau, Roger; Rogemont, Jean; Roques, Robert; Rouaud, Christian; and Royer, Henri, 3,820,799.
Rouek, Victor: *See—*
Donohue, James M.; Kramer, Joseph R.; and Rouek, Victor, 3,820,893.
Rounsaville, James F. Fertilizer composition and process. 3,820,971, Cl. 71-35.000.
Rover Company Limited, The: *See—*
Stubbs, Peter William Robert; and Crouch, Stephen John, 3,820,812.
Rowe, Joseph L.; Meeker, Leeman S.; and Calamas, Deleon Everette. Bait tank aeration device. 3,820,272, Cl. 43-57.000.
Rowenta Werke GmbH: *See—*
Remy, Hermann, 3,820,942.
Rowland, Howard J.: *See—*
Bickford, William J.; Rowland, Howard J.; and Tsao, Carson K. H., 3,821,646.
Royer, Henri: *See—*
Abbes, Claud; Bianchi, Santos; Chevallereau, Roger; Rogemont, Jean; Roques, Robert; Rouaud, Christian; and Royer, Henri, 3,820,799.
Rozanski, Henry A. Swimming pool construction. 3,820,174, Cl. 4-172.190.
Rubin, Isaac D.: *See—*

Yamamoto, Roy I.; and Cusano, Carmen M., 3,821,327.

Rubszinat, Willy: *See*—
Goldbach, Manfred; and Rubszinat, Willy, 3,820,505.

Rudaya, Sarra Markovna: *See*—
Zhdanovich, Jury Vasilievich; Lokshin, Galina Borisovna; Kuzovkov, Alexandr Dmitrievich; Rudaya, Sarra Markovna; and Solovieva, Nadezhda Konstantinovna, 3,821,085.

Rudolph, Rome R. In-line, positive drive, indexing unit. 3,820,411, Cl. 74-394.000.

Rudolph, Werner: *See*—
Hellberg, Karl-Heinz; Rudolph, Werner; and Massonne, Joachim, 3,821,321.

Ruelle, Gilbert; Carlier, Jacques; and Nithart, Henri, to Societe Generale de Constructions Electriques et Mecaniques (Alsthom). Transposed winding bar for a high-power electrical machine. 3,821,574, Cl. 310-213.000.

Ruider, Guenther; and Dimroth, Peter, to Badische Anilin-Fabrik Aktiengesellschaft. Azo pigments of the aminoanthraquinonylazo-β hydroxynaphthoic acid series. 3,821,191, Cl. 260-152.000.

Rule, Norman Geoffrey; and Riordan, Richard C., to Eastman Kodak Company. Tri-substituted methanes as organic photoconductors. 3,820,989, Cl. 95-1.500.

Rumbel, Keith E.: *See*—
Scurlock, Arch; Rumbel, Keith E.; and Rice, M. Lee, 3,821,041.

Runge, Heinz F., to Kraftco Corporation. Method of making dispensers. 3,821,046, Cl. 156-69.000.

Russell, Ernest R. Warning system indicating concurrent actuation of accelerator and brake controls. 3,821,700, Cl. 340-66.000.

Russell, Robert Jackson, to Koppers Company, Inc. Liner for grinding mills. 3,820,727, Cl. 241-183.000.

Russell, Rodney E. Salad on a stick. 3,821,425, Cl. 426-110.000.

Rust, Charles M.: *See*—
Roberts, Thomas G.; Rust, Charles M.; Rogers, Billie O.; Pratt, Henry L., III; and Morgan, Robert L., 3,820,562.

Ruter, Jorn; Magosch, Karl-Heinz; Rombusch, Konrad; and Eichers, Ursula, to Chemische werke Huls Aktiengesellschaft. Antistatic and dyeable thermoplastic molding compositions and shaped articles of polyolefins. 3,821,184, Cl. 260-93.700.

Rutner, Ivan Toby. Human reaction measuring means. 3,820,252, Cl. 35-22.00r.

Rx-Pack Company: *See*—
La Tourette, Charles; and Mullen, Patrick E. (said Mullen assor. to said), 3,820,655.

Ryder, Geoffrey A.: *See*—
Milik, Rudolf F. L., 3,820,760.

Rylicki, Edward J., to Induction Heating and Engineering Corporation. High frequency power generator. 3,821,632, Cl. 321-45.00r.

Ryu, Dewey D. Y.: *See*—
Lee, Bong Kuk; Ryu, Dewey D. Y.; and Pansy, Felix Edward, 3,821,198.

Ryzhkov, Viktor Kuzmich: *See*—
Chernyshev, Petr Sergeevich; Spiridonov, Konstantin Alexeevich; Pakhomov, Vladimir Alexandrovich; Nikolaev, Georgy Vasilievich; Volfson, Izrail Mordukhovich; Levchenko, Boris Leonidovich; Ryzhkov, Viktor Kuzmich; Gladkovsky, Petr Stanislavovich; Shargorodsy, Viktor Semenovich; and Shlyapin, Alexandr Nikolaevich, 3,820,915.

Sabet, Huschang. Rotary piston engine having mixture turbulence creating piston configurations. 3,820,512, Cl. 123-8.130.

Sabolic, Dubravko F., to Tony Construction, Inc. Externally regulated power phase control circuit. 3,821,634, Cl. 323-24.000.

Sabsay, Daniel M. Self re-keying security device with coded key. 3,821,704, Cl. 340-149.00a.

Sackner Products, Inc.: *See*—
Copeland, Richard S.; and Peters, Frederick D., 3,821,065.

Saegusa, Takeo; Fujii, Hiroyasu; and Ikeda, Hiroharu, to Japan Synthetic Rubber Co., Ltd. Crystalline polyethylenimine and hydrate thereof. 3,821,125, Cl. 260-2.0en.

Sage, Ira H., to Production Technology Inc., mesne. Inertia welding method for pipelines. 3,820,231, Cl. 29-470.300.

Sahaydak, Miroslaw: *See*—
Westall, Edward B.; Scanlan, James J.; and Sahaydak, Miroslaw, 3,821,417.

Saint Gobain Industries: *See*—
Roselli, Sergio, 3,821,593.

Saito, Tadaomi: *See*—
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Yoshida, Ryonosuke; Saito, Tadaomi; and Shimizu, Akira, 3,821,403.

Saito, Yoshio: *See*—
Ohe, Fumio; Saito, Yoshio; and Megumi, Naomitsu, 3,820,293.

Sakaguchi, Mitutoshi: *See*—
Fukuzuka, Toshio; Murakami, Tsuyoshi; Urai, Masaaki; and Sakaguchi, Mitutoshi, 3,820,368.

Sakakibara, Naoji, to Aisin Seiki Kabushiki Kaisha. Electronic speed control system for vehicles. 3,820,624, Cl. 180-105.00e.

Sakamoto, Hitoshi, to Sony Corporation. Video signal recording and reproducing apparatus with tape speed control. 3,821,803, Cl. 360-73.000.

Sakazaki, Tadazumi: *See*—
Urano, Fumio; Uno, Naoyuki; Nomura, Katsuhiko; Watanabe, Koichiro; Sakazaki, Tadazumi; and Miyata, Katsuhiko, 3,821,768.

Sakimoto, Reiji: *See*—
Noguchi, Teruhisa; Asada, Mitsuo; Sakimoto, Reiji; and Hashimoto, Koichi, 3,821,402.

Salari, Luciano: *See*—
Cavalieri d'Oro, Enzo; and Salari, Luciano, 3,821,741.

Salkeld, Larry A. Leg exercising apparatus. 3,820,782, Cl. 272-58.000.

Salotti, Gianfranco; and Palazzetti, Mario, to Fiat Societa per Azioni. Anti-skid braking system. 3,820,855, Cl. 303-21.0be.

Saly, Alexandr Andreevich: *See*—
Sippol, Nikolai Karlovich; and Saly, Alexandr Andreevich, 3,821,569.

Salyer, Ralph: *See*—
Crowe, Eugene Melroy, 3,820,332.

Sanders, James E.: *See*—
Gelin, Robert J.; and Sanders, James E., 3,821,543.

Sandner, Michael Ray: *See*—
Priest, David Charles; Sandner, Michael Ray; and Trecker, David John, 3,821,131.

Sandoz Ltd.: *See*—
Amati, Werner; and Hochreuter, Richard, 3,821,023.
Schoenauber, Wolfgang; and Steiner, Karl Ulrich, 3,821,262.

Sandoz Ltd., (also known as Sandoz AG): *See*—
Aebli, Horst; Fleck, Fritz; Kittl, Hans; and Schmid, Horst, 3,821,240.

Sandoz-Wander Inc.: *See*—
Anderson, Paul L.; and Manning, Robert E., 3,821,380.
Griot, Rudolf G., 3,821,248.

Sandvik Aktiebolag: *See*—
Lundstrom, Hans Per Olof; and Liljekvist, Bernt Soren, 3,820,849.

Sanitized, Incorporated: *See*—
Richter, Sven U.K.A., 3,821,399.

Santa Fe International Corporation: *See*—
Chang, Nuke Ming; Flowers, I. J.; and Anderson, Gordon M., 3,821,726.

Santora, Norman Julian: *See*—
Diamond, Julius; and Santora, Norman Julian, 3,821,267.
Diamond, Julius; and Santora, Norman Julian, 3,821,268.

Sarett, Lewis H.: *See*—
Arth, Glen E.; Sarett, Lewis H.; and Patchett, Arthur A., 3,821,374.

Sarkes Taizian, Inc.: *See*—
Busch, Albert E., 3,821,468.

Sarlos, Agoston, to Lampart. Varying velocity gearing. 3,820,410, Cl. 74-393.000.

Sartorius-Werke GmbH: *See*—
Berg, Christoph, 3,821,536.

Sato, Kunito; and Hegarty, Gerald R., to Armour and Company. Inhibition of warmed-over flavor in meats. 3,821,444, Cl. 426-175.000.

Sato, Masamichi: *See*—
Fukushima, Osamu; Sato, Masamichi; and Tamai, Yasuo, 3,820,986.

Satomi, Tokokazu: *See*—
Fujimoto, Sakae; Satomi, Tokokazu; Tomizuka, Mituo; Yamauchi, Masayuaki; and Ogawa, Toshiyuki, 3,820,776.

Sauer, Fritz: *See*—
Herl, Hans; Hurlebaus, Klaus; and Sauer, Fritz, 3,820,483.

Saur, Walter, to Hesser, Fr., Maschinenfabrik AG. Outlet closure in a packaging machine. 3,820,691, Cl. 222-560.000.

Sawada, Hiroshi: *See*—
Inoue, Tokuta; Sawada, Hiroshi; Ohnaka, Hidemi; and Ohshiro, Takao, 3,820,326.

Sawada, Takamasa: *See*—
Sone, Yoshiaki; and Sawada, Takamasa, 3,820,884.

Sawyer, Bobby Gene; and Francis, Robert Charles, to Deere & Company. Harvesting machine drive means. 3,820,311, Cl. 56-14.400.

Sayno Machine Works Ltd.: *See*—
Akashi, Hajime; Iwai, Sosuke; Fujimoto, Iwao; Hashimoto, Hiroshi; Abe, Tetsuo; Kato, Akira; and Suzuki, Masao, 3,820,623.

Scanlan, James J.: *See*—
Westall, Edward B.; Scanlan, James J.; and Sahaydak, Miroslaw, 3,821,417.

Scans Associates, Inc.: *See*—
Grikscheit, Henry W.; and Converse, Vernon G., 3,820,386.

Scarpa, Orlando, to Luciano Ciampi. Claw hook with an automatic safety device. 3,820,204, Cl. 24-232.000.

Scarpetti, Julius J., to Polaroid Corporation. Stereoscopic photographic print, method of making, and apparatus for viewing. 3,820,874, Cl. 95-1.00r.

Schaefer, Hans F., Jr.; and France, David W., to USM Corporation. Control pendants. 3,821,498, Cl. 200-18.000.

Scheidt, James E.: *See*—
Junck, John A.; and Scheidt, James E., 3,820,257.

Scheidweiler, Andreas: *See*—
Meier, Otto; and Scheidweiler, Andreas, 3,821,734.

Scherenberg, Hans O., to Daimler-Benz Aktiengesellschaft. Valve seat for the inlet valve in the cylinder head of a four-cycle internal combustion engine. 3,820,522, Cl. 123-188.00s.

Scheuerer, Guenter: *See*—
Vollrath, Robert; Boell, Walter; Scheuerer, Guenter; and Adolphi, Heinrich, 3,821,256.

Schier, Robert W. Serving utensil for fruits. 3,821,061, Cl. 161-42.000.

Schild, A., S.A.: *See*—
Fluck, Josef; and Zaugg, Roland, 3,820,318.

Schild, Manfred: *See*—
Brunning, Elmer Eugene; Grover, Donald P.; Schild, Manfred; and Nickelson, Robert William, 3,820,808.

Schindewolf, Ulrich: *See*—

Walter, Siegfried; and Schindewolf, Ulrich, 3,821,361.
Schindler, Leon A.; and Schindler, Raymond G. Fence fittings. 3,820,909, Cl. 287-54.000.
Schindler, Raymond G.: *See—*
Schindler, Leon A.; and Schindler, Raymond G., 3,820,909.
Schirmer, Robert M.; and Fromm, Ellsworth H., to Phillips Petroleum. Combustion method with controlled fuel mixing. 3,820,320, Cl. 60-39.060.
Schlengermann, Udo: *See—*
Grabendorfer, Werner; Gregor, Manfred; and Schlengermann, Udo, 3,820,387.
Schlicht, Raymond C.: *See—*
Arkell, Alfred; Schlicht, Raymond C.; and McCoy, Frederic C., 3,821,314.
Schluenz, Robert W.: *See—*
Relles, Howard M.; and Schluenz, Robert W., 3,821,164.
Schmid, Horst: *See—*
Aebli, Horst; Fleck, Fritz; Kittl, Hans; and Schmid, Horst, 3,821,240.
Schmid, Rolf: *See—*
Lohse, Friedrich; Schmid, Rolf; and Batzer, Hans, 3,821,165.
Schmidt, Andreas; and Brunetti, Heimo, to Ciba-Geigy Corporation. Process for the manufacture of p-hydroxybenzyl compounds. 3,821,334, Cl. 260-932.000.
Schmidt, Georg: *See—*
Jenner, Heinrich; and Schmidt, Georg, 3,820,340.
Schmidt, Gunther, to Bosch, Robert, G.m.b.H. Semi-conductor unit with flow-deposited solder. 3,821,614, Cl. 317-234.00r.
Schmidt, Paul; Moser, Peter; and Winkmann, Guenther, to Ciba-Geigy Corporation. 1-Imidazolyl-2-substituted hydroxy propyl amines. 3,821,241, Cl. 260-309.000.
Schnaibel, Eberhard; and Gotz, Werner, to Bosch, Robert, G.m.b.H., Gerlingen-Schillerhoehe. Automotive wheel brake anti-lock system. 3,820,857, Cl. 303-21.0be.
Schneider, Jos., & Co. Optische Werke: *See—*
Macher, Karl, 3,820,876.
Schnell, Hermann: *See—*
Schwarz, Hans Helmut; Immel, Otto; and Schnell, Hermann, 3,821,202.
Vernaleken, Hugo; Lange, Ralf; Schnell, Hermann; and Schwarz, Hans-Helmut, 3,821,294.
Schoch, Robert, to Weinmann Aktiengesellschaft. Plastic latch for skiboot. 3,820,256, Cl. 36-2.5al.
Schoen, Werner A.: *See—*
Kaiser, Richard B.; and Schoen, Werner A., 3,821,077.
Schoenauber, Wolfgang; and Steiner, Karl Ulrich, to Sandoz Ltd. Process for the production of anthraquinone derivatives chlorinated in alpha-positions. 3,821,262, Cl. 260-380.000.
Scholl, Rolland D., to Caterpillar Tractor Company. Control circuit with deadband compensation for electrically actuated devices. 3,821,625, Cl. 318-624.000.
Scholz, Hansjurgen: *See—*
Allgaier, Rudolf; Brambilla, Luigi; and Scholz, Hansjurgen, 3,820,814.
Schomaker, Karl H.; and Shontz, Henry E., to N. W. Controls, Inc. Safety switch for snowmobiles and the like having flexible operating part detechable from switch housing by cord. 3,821,504, Cl. 200-52.00r.
Schommarz, Gunther: *See—*
Delf, Gerhard; and Schommarz, Gunther, 3,820,938.
Schrecongost, Ray B., to Hammond Corporation. Percussion to direct keying switching circuit for an electrical musical instrument. 3,821,459, Cl. 84-1.130.
Schreier, Wilford R.: *See—*
Petrie, Adelore F.; and Schreier, Wilford R., 3,821,457.
Schreier, Wilford R., to Hammond Corporation. Repetitive keyer actuating circuit for an electrical musical instrument. 3,821,458, Cl. 84-1.130.
Schroeder, Charles J.: *See—*
Balch, James L.; Anderson, James E.; and Schroeder, Charles J., 3,820,219.
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weib, Gunter, to Afga-Gevaert Aktiengesellschaft. Method of solvent sealing plastic film cassette seams. 3,821,047, Cl. 156-69.000.
Schubert, Bernhard; and Bardenhagen, Dietrich, to Hauni-Werke Korber & Co. KG. Apparatus for transporting receptacles. 3,820,671, Cl. 214-16.40c.
Schuckert, Frederick A.: *See—*
Snyder, James J.; and Schuckert, Frederick A., 3,821,037.
Schudy, Fred Frank. Typodont bracket. 3,820,243, Cl. 32-71.000.
Schulte, Karl: *See—*
Koppe, Volker; Schulte, Karl; Borck, Joachim; Poetsch, Eike; and Muller-Calgan, Helmut, 3,821,234.
Schultze, Manfred, to Siemens Aktiengesellschaft. Arrangement for controlling the orientation of characters on a display device utilizing angle defining data syllables and data addition for such syllables. 3,821,729, Cl. 340-324.00a.
Schulze, Gerhard; Sliwka, Artur; and Wittmann, Georg, to Badische Anilin- & Soda Fabrik Aktiengesellschaft. Selective hydrogenation of minor amounts of acetylene in a gas mixture containing major amounts of ethylene. 3,821,323, Cl. 260-677.00h.
Schulze, Heinz, to VEB Pentacon Dresden Kamera- und Kinowerke. Photographic camera. 3,821,755, Cl. 354-24.000.
Schwager, Irving: *See—*
Knifton, John F.; and Schwager, Irving, 3,821,309.
Schwartz, Carl H., to Dentsply International Inc. Patching method. 3,821,006, Cl. 106-85.000.
Schwarz, Hans Helmut; Immel, Otto; and Schnell, Hermann, to Bayer Aktiengesellschaft. Process for purifying lactams. 3,821,202, Cl. 260-239.30a.
Schwarz, Hans-Helmut: *See—*
Vernaleken, Hugo; Lange, Ralf; Schnell, Hermann; and Schwarz, Hans-Helmut, 3,821,294.
Schwarzenbach, Alfred, to BBC Brown Boveri & Company Limited. Condensation plant for a steam turbine. 3,820,336, Cl. 60-693.000.
Schwarzler, Peter, to Krauss-Maffei Aktiengesellschaft. Two-sided linear induction motor especially for suspended vehicles. 3,820,472, Cl. 104-148.0lm.
Schweitzer, H. E., AG: *See—*
Schweitzer, Hans Erich, 3,820,679.
Schweitzer, Hans Erich, to Schweitzer, H. E., AG. Cellular structure for electrical modules or the like. 3,820,679, Cl. 202-22.300.
Schweizerische Industrie-Gesellschaft: *See—*
Fluck, Rene, 3,820,649.
Schwieter, Ulrich: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,821,284.
Schwinum, Ernst: *See—*
Blahak, Johannes; Muller, Erwin; Mott, Ludwig; and Schwinum, Ernst, 3,821,282.
Schwuttke, Guenter Helmut, to International Business Machines Corporation. Method for fabricating semiconductor structures with minimum crystallographic defects. 3,821,038, Cl. 148-186.000.
SCI Systems, Inc.: *See—*
Fisher, Alan J., 3,821,655.
Science Union et Cie: *See—*
Malen, Charles; and Desnoyers, Pierre, 3,821,237.
Regnier, Gilbert; Canevari, Roger; and Suhault, Jacques, 3,821,225.
Science-Union et Cie: *See—*
Malen, Charles; Danree, Bernard; and Poignant, Jean-Claude, 3,821,249.
Scientific Anglers, Inc.: *See—*
Martuch, Leon L.; and Kreh, Bernard, 3,820,271.
SCM Corporation: *See—*
Acker, Donald F.; and Klein, Dietrich J., 3,821,048.
Scofield, Bruce A., to International Harvester Company. Switching circuitry for sequential fuel injection. 3,820,198, Cl. 123-32.0ea.
Scott, O. M., & Sons Company, The: *See—*
Robinson, Donald E., 3,820,312.
Scott Paper Company: *See—*
Kaiser, Richard B.; and Schoen, Werner A., 3,821,077.
Shaw, David L., 3,821,068.
Scott, Roderic M., to Perkin-Elmer Corporation, The. Annular field optical imaging system. 3,821,763, Cl. 354-94.000.
Scovill Manufacturing Company: *See—*
Flowers, Theodore Robert, 3,820,259.
Scovronek, Jacob, to Burroughs Corporation. Gas-filled display device having mercury inlet shield. 3,821,584, Cl. 313-174.000.
Scruggs, James A.: *See—*
Kraus, Theodore C.; Scruggs, James A.; and Trotz, Sameul I., 3,821,360.
Scurlock, Arch; Rumbel, Keith E.; and Rice, M. Lee, to Atlantic Research Corporation. Beryllium containing rocket propellants producing maximum boost velocity. 3,821,041, Cl. 149-19.000.
Searle, G. D., & Co.: *See—*
Chinn, Leland J., 3,821,283.
Seeley, Robert D.: *See—*
Thompson, Granville B.; and Seeley, Robert D., 3,821,416.
Seewagen, George L.; and Markisz, John A. Tennis ball retrieval device. 3,820,836, Cl. 294-19.00a.
Seidel, William C.: *See—*
Mitchell, William A.; and Seidel, William C., 3,821,433.
Seiko Koki Kabushiki Kaisha: *See—*
Murakami, Takeshi; Nakamura, Yukio; Onda, Eiichi; and Morino, Yukio, 3,821,750.
Sejbal, Josef; and Curn, Frantisek, to Naradi Narodni podnik. Diamond grinding layer for honing segments. 3,820,966, Cl. 51-309.000.
Sell, Heinz G.; and Stepper, Heinz-J, to Westinghouse Electric Corporation. Method of making non-sag incandescent tungsten filament. 3,820,868, Cl. 316-1.000.
Selliken, Gary M. Removable winch drum for vehicle wheel. 3,820,734, Cl. 242-95.000.
Semenov, Oleg Alexeevich: *See—*
Bogrets, German Nikolaevich; Semenov, Oleg Alexeevich; Dudkin, Vyacheslav Fedorovich; and Vorontsov, Anatoly Konstantinovich, 3,820,969.
Semm, Kurt. Device for effecting temporary sterilization. 3,820,544, Cl. 128-326.000.
Sensinger, Warner E., Jr.: *See—*
Buse, Frederic W.; and Sensinger, Warner E., Jr., 3,820,922.
Seo, Kiyokazu; Hayashi, Yoshihiro; Hoshino, Tunekichi; and Masuda, Fumiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha, Kabushiki Kaisha Tokai Rika Denki Seisakusho and Hoshino Kogyo Kabushiki Kaisha. Webbing and belting means for use in seat belts. 3,820,43, Cl. 297-387.000.
Sergant, Micheline Y.: *See—*
Fauran, Claude P.; Douzon, Colette; Raynaud, Guy M.; and Sergant, Micheline Y., 3,821,215.

Serizawa, Akio, to Sony Corporation. Tape loading device for magnetic recording and/or reproducing apparatus. 3,821,805, Cl. 360-85.000.

Serrano, Pedro, to AMP Incorporated. Terminal inserting apparatus. 3,820,218, Cl. 29-203.00b.

Sestanj, Kazimir; Simard-Duquesne, Nicole; and Dvornik, Dusan M., to Ayerst, McKenna and Harrison Limited. Compositions for and a method of treating diabetic complications. 3,821,383, Cl. 424-258.000.

Seyfried, Franz: *See—*
Andres, Rudolf; Moller, Hermann; and Seyfried, Franz, 3,820,382.

Seymour, Edgar Wilson, to Ithaco Inc. Corrosion measuring bridge circuit having automatic controlled constant source of energy and temperature compensation. 3,821,642, Cl. 324-65.0cr.

Seymour Foods, Inc.: *See—*
Willsey, Charles H., 3,820,301.

Shah, Jagdeep Chandravadan: *See—*
DeWinter, John Christian; Leheny, Robert Francis; Nahory, Robert Edward; Shah, Jagdeep Chandravadan; and Shaklee, Kerry Lee, 3,821,662.

Shakespeare Company: *See—*
Carmody, Raymond Francis, 3,820,573.

Shaklee, Kerry Lee: *See—*
DeWinter, John Christian; Leheny, Robert Francis; Nahory, Robert Edward; Shah, Jagdeep Chandravadan; and Shaklee, Kerry Lee, 3,821,662.

Shamash, Maurice B.: *See—*
Lindberg, Frank A.; Ponemone, Seymour J.; Konsowski, Stephen G.; and Shamash, Maurice B., 3,820,994.

Shamban, W. S., & Co.: *See—*
Dryer, Eldon O., 3,820,830.

Shandalov, Efim Mikhelevich: *See—*
Gamer, Abram Yakovlevich; and Shandalov, Efim Mikhelevich, 3,820,396.

Shang, Jer-Yu; and Hansel, William B., to Sun Research and Development Co. Apparatus for irradiation of laser cavity. 3,821,660, Cl. 331-94.500.

Shanks, Bruce E., to General Electric Company. Method of manufacturing lamp with filament support structure. 3,820,207, Cl. 29-25.150.

Shargorodsky, Viktor Semenovich: *See—*
Chernyshev, Petr Sergeevich; Spiridonov, Konstantin Alexeevich; Pakhomov, Vladimir Alexandrovich; Nikolaev, Georgy Vasilievich; Volfson, Izrail Mordukhovich; Levchenko, Boris Leonidovich; Ryzhkov, Viktor Kuzmich; Gladkovsky, Petr Stanislavovich; Shargorodsy, Viktor Semenovich; and Shlyapin, Alexandr Nikolaevich, 3,820,915.

Shavel, John, Jr.: *See—*
Sircar, Jagadish C.; Zinnes, Harold; and Shavel, John, Jr., 3,821,211.

Shaw, David L., to Scott Paper Company. Soft, absorbent, fibrous, sheet material formed by avoiding mechanical compression of the fiber furnish until the sheet is at least 80% dry. 3,821,068, Cl. 162-111.000.

Shaw, Gilbert; deceased; and Anderson, Charles H., Jr., Shaw, Cloria E.; executrix assor. to said Polymers, Inc. Package of cut filaments. 3,820,653, Cl. 206-525.000.

Shaw, Richard N., to McClive, R. Thomas. Method of sealing a burial casket. 3,820,205, Cl. 27-19.000.

Shea, Philip J.: *See—*
Barnhart, James W.; and Shea, Philip J., 3,821,411.

Sheckler, Addison C.: *See—*
Wells, John B.; and Sheckler, Addison C., 3,820,987.

Sheetz, Charles E., to FMC Corporation. Conveyer feeder. 3,820,496, Cl. 214-313.000.

Shelby, James Henry; and Richter, Fred Eric, to RCA Corporation. Film type capacitor and method of adjustment. 3,821,617, Cl. 317-261.000.

Sheldon Industries Inc.: *See—*
McInnis, Andrew M., 3,820,458.

Shell Oil Company: *See—*
Aspin, Frank Metcalf, 3,820,933.
Karnes, George T., 3,820,604.
Luque, Rafael Fernandez, 3,820,339.
Mulder, Albertus J.; and van Helden, Robert, 3,821,266.
Walker, George E., Jr.; and Hemphill, Dean P., 3,820,601.

Shelledy, Frank B.: *See—*
Abbott, Chester D.; Brock, George W.; Robinson, Neil L.; Shelledy, Frank B.; and Smith, Sidney H., 3,821,815.

Shelton, William A., to Polaroid Corporation. Illuminating apparatus. 3,821,764, Cl. 354-126.000.

Shema, Bernard F.: *See—*
Brink, Robert H., Jr.; Shema, Bernard F.; and Swered, Paul, 3,821,369.

Shema, Bernard F.; Brink, Robert H., Jr.; and Justice, Roger L., to Betz Laboratories, Inc. Composition and method for controlling aerobacter aerogenes. 3,821,396, Cl. 424-275.000.

Shen, Tsung-Ying: *See—*
Pessolano, Arsenio A.; Witzel, Bruce E.; Graham, Patricia M.; Clark, Robert L.; and Shen, Tsung-Ying, 3,821,201.

Shenk, Edwin K., to Polaroid Corporation. Exposure control system incorporating solid state switching to enable a light sensitive network. 3,821,547, Cl. 250-214.00p.

Shepherd, Edmund J.: *See—*
Ambrose, John; and Shepherd, Edmund J., 3,821,050.

Shepherd, Lawrence H., Jr.: *See—*
Brendel, Gottfried J.; and Shepherd, Lawrence H., Jr., 3,821,318.

Shepherd, Lawrence H., Jr., to Ethyl Corporation. Polycyclic compounds. 3,821,322, Cl. 260-666.0py.

Sherwin-Williams Company, The: *See—*
Foster, Harold Marvin, 3,821,410.
Grivas, John C., 3,821,389.

Shevell, Walter I.: *See—*
Eaton, Homer L.; and Shevell, Walter I., 3,821,525.

Shiffler, George M.; and Baskin, H. H., Jr. Blocking device for locking sliding closures. 3,820,285, Cl. 49-450.000.

Shiguma, Heijiro; and Suzuki, Shigekazu, to NHK Spring Co., Ltd. Apparatus for manufacturing leaf springs having a tapered end portion. 3,820,373, Cl. 72-185.000.

Shimamura, Isao: *See—*
Shirasu, Kazuo; Hatano, Tadao; Shimamura, Isao; Ozawa, Mitsuo; and Iwano, Haruhiko, 3,820,997.

Shimizu, Akira: *See—*
Misato, Tomomasa; Huang, Keng Tang; Homma, Yasuo; Yoshida, Ryonosuke; Saito, Tadaomi; and Shimizu, Akira, 3,821,403.

Shimodiara, Takashi: *See—*
Kanetaka, Junichi; Shimodiara, Takashi; and Hayashi, Kuniaki, 3,821,245.

Shimomura, Takayoshi: *See—*
Kubotera, Haruo; Hashimoto, Yukio; Ohkubo, Masuta; Gonda, Hisashi; Tanaka, Nobuo; Matsudo, Kazuo; and Shimomura, Takayoshi, 3,821,031.

Shin-Nihon Reiki Co. Ltd.: *See—*
Shiraishi, Hipoo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,820,353.

Shinada, Hidehiro: *See—*
Ohmae, Kenji; Shinada, Hidehiro; and Nikkawa, Hisashi, 3,820,937.

Shiokawa, Kozo: *See—*
Kishino, Shigeo; Kudamatsu, Akio; Shiokawa, Kozo; and Yamaguchi, Shinich, 3,821,246.

Shipinski, John Henry, to Deere & Company. Fuel injection nozzle for internal combustion engine and the like. 3,820,723, Cl. 239-533.000.

Shiraishi, Hipoo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, to Japan Gasoline Co., Ltd. and Shin-Nihon Reiki Co. Ltd. Evaporative cooling apparatus. 3,820,353, Cl. 62-305.000.

Shirasu, Kazuo; Hatano, Tadao; Shimamura, Isao; Ozawa, Mitsuo; and Iwano, Haruhiko, to Fuji Photo Film Co., Ltd. Method of color development processing for forming stable photographic images. 3,820,997, Cl. 96-56.000.

Shlyapin, Alexandr Nikolaevich: *See—*
Chernyshev, Petr Sergeevich; Spiridonov, Konstantin Alexeevich; Pakhomov, Vladimir Alexandrovich; Nikolaev, Georgy Vasilievich; Volfson, Izrail Mordukhovich; Levchenko, Boris Leonidovich; Ryzhkov, Viktor Kuzmich; Gladkovsky, Petr Stanislavovich; Shargorodsy, Viktor Semenovich; and Shlyapin, Alexandr Nikolaevich, 3,820,915.

Sholer, Lawrence J. Electrical connector. 3,821,695, Cl. 339-258.00f.

Sholtes, Carl E., to Westinghouse Electric Corporation. Method of fabricating a cooling chamber for a water cooler. 3,820,214, Cl. 29-157.30r.

Shontz, Henry E.: *See—*
Schomaker, Karl H.; and Shontz, Henry E., 3,821,504.

Showalter, Merle Robert; and Rhine, Samuel. Internal combustion chamber. 3,820,523, Cl. 123-191.00a.

Shraifeld, Tamara Yakovlevna: *See—*
Andreev, Oleg Semenovich; Birjukov, Boris Konstantinovich; Byzov, Yury Mikhailovich; Lekhtman, Moisei Abramovich; Perelberg, Azik Iosifovich; Strimbling, Semen Itskhovich; Trachevsky, Boris Sergeevich; Fikhman, Isak Berovich; Cherepakha, Pavel Andreevich; nd Shraifeld, Tamara Yakovlevna, 3,821,749.

Shramovich, John W.: *See—*
Acerra, Roger J.; Manley, Patrick J.; and Shramovich, John W., 3,820,283.

Shtarkman, Boris Petrovich: *See—*
Mihalev, Nikolai Alexandrovich; and Shtarkman, Boris Petrovich, 3,820,957.

Siddall, John B.: *See—*
Henrick, Clive A.; and Siddall, John B., 3,821,269.

Sidebottom, Ray F. Viscous fluid handling device. 3,820,577, Cl. 141-67.000.

Siebel, John E. Coaxial valve. 3,820,757, Cl. 251-139.000.

Sieckman, Walter; Maurice, Harvey W.; and Pearce, Jai K., to Pennsylvania Engineering Corporation. Steel conversion method and apparatus. 3,820,768, Cl. 266-35.000.

Siedenstrang, Roy W.: *See—*
Cornell, William H.; and Siedenstrang, Roy W., 3,821,152.

Siefen, Jakob: *See—*
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weib, Gunter, 3,821,047.

Sieffert, William G., to Olinkraft, Inc. Shipping container. 3,820,708, Cl. 229-40.000.

Sieffert, William G., to Olinkraft, Inc. Shipping container. 3,820,709, Cl. 229-40.000.

Siegel, Emil, to Bosch, Robert, Fernsehandagen GmbH. Vertical deflection circuit for a color television camera having different raster sizes in its channels. 3,821,592, Cl. 315-13.00c.

Siegwart, Hans Rudolf: *See—*
Brandestini, Antonio; Siegwart, Hans Rudolf; and Kaser, Rene, 3,820,832.

Siemens Aktiengesellschaft: *See—*
Aidn, Martin; Furtwangler, Gerhard; and Wanka, Eberhard, 3,821,674.
Dietze, Wolfgang, 3,820,935.
Greubel, Waldemar; Krueger, Hans; and Wolff, Ulrich, 3,821,720.
Hoffmann, Manfred, 3,821,619.
Katz, Helmut, 3,820,919.
Katz, Helmut; and Huebner, Erwin, 3,821,589.
Kindl, Helmut; and Met, Viktor (said Kindl assor. to), 3,820,903.
Ost, Joachim, 3,821,722.
Roess, Dieter, 3,820,897.
Schultze, Manfred, 3,821,729.
Stut, Hans, 3,821,515.
Thomann, Helmut, 3,821,667.
Zerbst, Helmut; Weyl, Reinhard; and Dietrich, Isolde, 3,821,554.

Sieper, Horst, to Sintronik; Electronik und Apparatebau GmbH. Worm Catching device with safety features. 3,820,279, Cl. 47-1.300.

Sierra Research Corporation: *See—*
Chisholm, John P.; Lennon, William T., Jr.; Doane, James R.; and Maslow, Frank Z., 3,821,523.

Sigfrid, Eric, to Expo Nord AB. Sitting furniture. 3,820,845, Cl. 297-445.000.

Signetics Corporation: *See—*
Hoeft, Werner H., 3,821,658.
Rose, Ralph Edward, 3,821,785.

Sigulas, George N.: *See—*
Menne, Joseph D.; and Sigulas, George N., 3,820,227.

Silva, Antonia Vicente, to Westinghouse Electric Corporation. Automatic extension control. 3,820,365, Cl. 72-8.000.

Silvia, Denis A. Initiation aimed explosive devices. 3,820,461, Cl. 102-22.000.

Simard-Duquesne, Nicole: *See—*
Sestanj, Kazimir; Simard-Duquesne, Nicole; and Dvornik, Dusan M., 3,821,383.

Simon, Michael, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Air cushion vehicle, especially rail-bound air cushion vehicle. 3,820,468, Cl. 104-23.0fs.

Simonovitch, Chaim: *See—*
Haber, Raphael Ralph G.; and Simonovitch, Chaim, 3,821,235.

Sims, Clarence R. Combination cleaner, polisher and waxing device for walls and floors. 3,820,905, Cl. 401-140.000.

Singer Company, The: *See—*
Bradus, Robert; Bruder, Edward A.; and Rogers, Frederick, 3,820,485.
Fromknecht, Charles T.; and Davis, John C., 3,820,310.
Stavis, Gus, 3,820,896.

Sinnott, David J.; and Alecci, Donald E., to Star-New Era, Inc. Multifont photocomposing mechanism. 3,821,753, Cl. 354-93.000.

Sintronik; Electronik und Apparatebau GmbH: *See—*
Sieper, Horst, 3,820,279.

Sippel, Nathan J., to United States of America, Navy. Hydrazine gel composition. 3,821,043, Cl. 149-36.000.

Sippol, Nikolai Karlovich; and Saly, Alexandr Andreevich. Electric machine rotor. 3,821,569, Cl. 310-64.000.

Sircar, Jagadish C.; Zinnes, Harold; and Shavel, John, Jr., to Warner-Lambert Company. Process for the preparation of 4-hydroxy-3-(5-methyl-3-isoxazolylcarbamoyl)-2H-1,2-benzothiazine 1,1-dioxide. 3,821,211, Cl. 260-243.00r.

Sisson, Jeffrey L.; and Norder, Paul D., to Xerox Corporation. Apparatus for sensing a dimension of sheets of material to be transported through an electrostatic reproduction machine. 3,820,591, Cl. 165-39.000.

Sivash, Konstantin Mitrofanovich. Artificial hip joint. 3,820,167, Cl. 3-1.000.

Six, Edouard Raymond. Hank carriers. 3,820,735, Cl. 242-110.000.

SKF Compagnie d'Applications Mecaniques: *See—*
Fauve, Jean, 3,821,613.

SKF Industrial Trading and Development Company B.V.: *See—*
Petre, James Gusten Ragnar, 3,820,864.

Sliwka, Artur: *See—*
Schulze, Gerhard; Sliwka, Artur; and Wittmann, Georg, 3,821,323.

Sloeva, Galina Nikolaevna: *See—*
Alexandrovich, Eduard-Gely Vitalievich; Belkin, Nikolai Vasilievich; Zelensky, Konstantin Fedorovich; Kanunov, Mikhail Alexeevich; Razin, Anatoly Alexandrovich; Tarasova, Ljudmila Viktorovna; Toropov, Anatoly Pavlovich; Troshkin, Ivan Andreevich; Khudyakov, Ljubov Nikolaevna; Tsukerman, Veniamin Aronovich; Dron, Ninel Alexeevna; Sloeva, Galina Nikolaevna; Ioffe, Jury Konstantinovich; and Vasiliev, Vasily Vasilievich, 3,821,580.

Slone, Thomas J., to Procter & Gamble Company, The. Package of frangible comestible products and means for retaining crumbs thereof. 3,821,426, Cl. 426-115.000.

Smadja, Rene: *See—*
Goyer, Andre; and Smadja, Rene, 3,821,144.

Small, Frederick B., to Crouse-Hinds Company. Underwater electrical connector. 3,821,690, Cl. 339-75.00r.

Smith, Andrew W., Jr., to Westinghouse Electric Corporation. Rolling mill gauge control method and apparatus including temperature and hardness correction. 3,820,366, Cl. 72-9.000.

Smith, Francis Hughes, to Vickers Limited. Photometric instruments. 3,820,870, Cl. 350-33.000.

Smith, John William, to Chloride Batteries Australia Limited. Battery and intercell connector. 3,821,029, Cl. 136-134.00r.

Smith, Shirley M.: *See—*
Dugan, James G.; Hancock, Albert S., Jr.; Hausske, Gene W.; Huston, Kenneth G.; Rosenberg, Bernard L.; and Smith, Shirley M., 3,820,507.

Smith, Sidney H.: *See—*
Abbott, Chester D.; Brock, George W.; Robinson, Neil L.; Shelledy, Frank B.; and Smith, Sidney H., 3,821,815.

Smith, Sidney Z.: *See—*
Swett, James B.; and Smith, Sidney Z., 3,820,692.

Smith, Treva M.: *See—*
Lipscomb, Charles A., Jr.; and Smith, Treva M., 3,821,120.

Smithkline Corporation: *See—*
Chow, Alfred W.; Dunn, George L.; Hoover, John R. E.; and Weisbach, Jerry A., 3,821,207.
Loev, Bernard, 3,821,386.
Sutton, Blaine M., 3,821,397.
Sutton, Blaine M., 3,821,398.

Smorodinov, Alexandr Nikolaevich: *See—*
Nikiforov, Vladimir Pavlovich; Nosikov, Vasily Ivanovich; Kil, Ilya Genrikhovich; Tsybukov, Igor Kirillovich; Smorodinov, Alexandr Nikolaevich; Tsyplakov, Anatoly Mikhailovich; Budkevich, Nikolai Pavlovich; and Vykhodov, Nikolai Ivanovich, 3,821,101.

Snodgrass, Hugh E.: *See—*
Lauchlan, Robert L.; and Snodgrass, Hugh E., 3,821,326.

Snook, Randolph W., to Pullman Incorporated. Method of providing expansible chimneys. 3,820,228, Cl. 29-446.000.

Snow, Austin Matthew, Jr.: *See—*
Cluff, Edward Fuller; and Snow, Austin Matthew, Jr., 3,821,143.

Snow, Roland B., to United States Steel Corporation. Sub-hearth construction for metallurgical furnaces. 3,820,770, Cl. 266-43.000.

Snyder, James J.; and Schuckert, Frederick A., to Park-Ohio Industries, Inc. Method and apparatus for cooling locally heated workpieces. 3,821,037, Cl. 148-145.000.

Snyder, Paul F.: *See—*
Snyder, Raymond C.; and Snyder, Paul F., 3,820,612.

Snyder, Raymond C.; and Snyder, Paul F. Method for lubricating an unsealed boring bit. 3,820,612, Cl. 175-70.000.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Cavalieri d'Oro, Enzo; and Salari, Luciano, 3,821,741.

Societe Anonyme D.B.A.: *See—*
Toulier, Pierre, 3,820,406.

Societe Anonyme dite: L'Oreal: *See—*
Vanlerberghe, Guy, 3,821,372.

Societe Anonyme dite: Ratier-Forest: *See—*
Poincenot, Rene, 3,820,234.

Societe d'Assistance Technique pour Produits Nestle: *See—*
Mishkin, Abraham Rudolph; and Anderson, James Leroy, 3,820,250.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Kalina, Vladimir; and Nicolas, Pierre, 3,821,080.
Van Leemputten, Ekkerhard; and Horisberger, Marc, 3,821,083.

Societe Dauphinoise Electrique: *See—*
Laurent, Daniel, 3,821,497.

Societe des Usines Chimiques: *See—*
Pages, Michel, 3,820,661.

Societe Francaise de Recherche Medicale: *See—*
Malen, Charles; and Desnoyers, Pierre, 3,821,237.
Malen, Charles; Danree, Bernard; and Poignant, Jean-Claude, 3,821,249.

Societe Generale de Constructions Electriques et Mecaniques (alsthom): *See—*
Gillet, Roger, 3,821,568.
Ruelle, Gilbert; Carlier, Jacques; and Nithart, Henri, 3,821,574.

Societe Labavia-S.G.E.: *See—*
Bessiere, Pierre Etienne, 3,821,572.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Bonneaud, Henri Auguste; and Hoch, Rene Gerard, 3,820,626.

Soga, Setsuo: *See—*
Kurakawa, Junji; and Soga, Setsuo, 3,820,891.

Sohnchen, Ernst; and Feldmann, Ernst, to Vaillant, Joh., K.G. Solenoid assembly and thermoelectric flame failure device. 3,821,675, Cl. 335-281.000.

Sokoloff, Boris Alexandre. Electronic control unit for the linking of symmetrical closed chains of words in a random-access memory. 3,821,708, Cl. 340-172.500.

Soletanche, Societe Anonyme: *See—*
Caron, Claude; and Hurtado, Jean, 3,820,344.

Solitron Devices, Inc.: *See—*
Nordstrom, Donald B.; and Napierkowski, Peter, 3,821,615.

Solop, Eli, to Phillips Petroleum Company. Extra high molecular weight particle form polyethylene-polyisobutylene blend. 3,821,332, Cl. 260-897.00a.

Solovieva, Nadezhda Konstantinovna: *See—*
Zhdanovich, Jury Vasilievich; Lokshin, Galina Borisovna; Kuzovkov, Alexandr Dmitrievich; Rudaya, Sarra Markovna; and Solovieva, Nadezhda Konstantinovna, 3,821,085.

Son, Pyong-Nae; and Baranwal, Krishna C., to Goodrich, B. F., Company, The. Vulcanizable polymer blends of diene rubbers and grafted EPDM polymers. 3,821,134, Cl. 260-5.000.
Sone, Yoshiaki; and Sawada, Takamasa, to Canon Kabushiki Kaisha. Search reader. 3,820,884, Cl. 353-26.000.
Sony Corporation: *See—*
Horinaga, Hiroshi, 3,821,565.
Iketaki, Kazuo; and Hashizaki, Kazuo, 3,821,467.
Kihara, Nobutoshi, 3,821,787.
Nagakura, Katsuhiko; and Kamoto, Hidetoshi, 3,821,535.
Nakajima, Kazuhiko, 3,821,791.
Ohsawa, Mitsuo, 3,821,474.
Sakamoto, Hitoshi, 3,821,803.
Serizawa, Akio, 3,821,805.
Sumiyoshi, Koichiro, 3,821,799.
Suzuki, Norihiro; and Takizawa, Kazuyuki, 3,820,797.
Takeda, Masashi; and Kikuchi, Masafumi, 3,821,656.
Sosner, Jury Moiseevich: *See—*
Agushev, Vladimir Alexandrovich; Brusilovsky, Iosif Veniaminovich; Gamajunov, Alexandr Mikhailovich; Lanchikov, Konstantin Vasilievich; Sosner, Jury Moiseevich; Tsodikov, Veniamin Yakovlevich; and Judochkin, Sergei Sergeevich, 3,820,916.
Southco Inc.: *See—*
Barry, John K., 3,820,579.
Southern Iron & Equipment Company: *See—*
Harter, Lynn J.; and Warshal, Morris, 3,820,476.
Spacil, Henry S., to General Electric Company. Hydrogen production by dissociation of steam with liquid tin. 3,821,362, Cl. 423-657.000.
Spaeder, Carl E., Jr., to United States Steel Corporation. Method of forming composite rolls. 3,820,212, Cl. 29-148.40d.
Sparks, James I.; and Spivy, Paul L., to Dayco Corporation. Apparatus for and method of making a multiple layer sheet. 3,820,583, Cl. 156-190.000.
Spectronics, Incorporated: *See—*
Biard, James R., 3,821,775.
Speedco, Inc.: *See—*
Good, Paul F., 3,820,289.
Speidel Foundation & Marine, Inc.: *See—*
Morren, George J.; and Berndt, Neil R., 3,820,343.
Sperry Rand Corporation: *See—*
Erickson, Ernest S., 3,821,517.
Klimaszewski, Richard A.; and Court, Kenneth, 3,820,920.
Lewis, Edward T., 3,820,401.
Wesner, Charles R., 3,821,600.
Spiridonov, Konstantin Alexeevich: *See—*
Chernyshev, Petr Sergeevich; Spiridonov, Konstantin Alexeevich; Pakhomov, Vladimir Alexandrovich; Nikolaev, Georgy Vasilievich; Volfson, Izrail Mordukhovich; Levchenko, Boris Leonidovich; Ryzhkov, Viktor Kuzmich; Gladkovsky, Petr Stanislavovich; Shargorodsy, Viktor Semenovich; and Shlyapin, Alexandr Nikolaevich, 3,820,915.
Spivack, John D., to Ciba-Geigy Corporation. Metal complexes of n,n-dialkylesters of ethylenedinitrilo-tetraacetic acid stabilizers for polymers. 3,821,163, Cl. 260-45.75r.
Spivy, Paul L.: *See—*
Sparks, James I.; and Spivy, Paul L., 3,820,583.
Spray Engineering Company: *See—*
Pohle, Werner P., 3,820,717.
Springer, Lamar D.; Mullendore, David L.; and Marcum, Alfred L., Jr., to Price Brothers Company. Method and apparatus for controlling bevel wrapping mechanism. 3,820,729, Cl. 242-7.210.
Square D Company: *See—*
Isaac, Donald, Jr.; and Bishop, Clifford F., 3,821,532.
Squibb, E. R., & Sons, Inc.: *See—*
Krapcho, John; and Turk, Chester Frank, 3,821,377.
Lee, Bong Kuk; Ryu, Dewey D. Y.; and Pansy, Felix Edward, 3,821,198.
SSR Instruments Company: *See—*
Olson, Gaylord G., 3,820,898.
Staake, Donal B.: *See—*
Kuck, John H.; and Staake, Donal B., 3,821,736.
Staba, Edward A., to Olin Corporation. Method and apparatus for the automatic charging of primer containers. 3,820,578, Cl. 141-190.000.
Stables, Harry Carson; Atherton, John; and Matchan, Michael John, to Glaxo Laboratories Limited. Recovery of cephalosporin C and derivatives thereof. 3,821,208, Cl. 260-243.00c.
Stadler, Paul: *See—*
Fehr, Theodor; Stuetz, Peter; and Stadler, Paul, 3,821,226.
Stafford, Richard W.: *See—*
Homan, William N.; and Stafford, Richard W., 3,821,503.
Stal Refrigeration AB: *See—*
Brandin, Tore; and Lundberg, Anders, 3,820,350.
Stamicarbon N.V.: *See—*
Beekhuis, Gerrit E.; and Klein, Joseph F. M., 3,821,274.
DeRooij, Abraham H., 3,820,972.
Stamp, Tom G.: *See—*
De Pauw, Richard A.; and Stamp, Tom G., 3,820,618.
Stanciu, Virgil V., to Tempcraft Tool & Mold, Inc. Apparatus for molding ceramic cores and wax or plastic patterns. 3,820,753, Cl. 249-164.000.
Standard Brands Incorporated: *See—*
Lamm, William R.; Davis, Larry G.; and Dworschack, Robert G., 3,821,082.
Standard Oil Company: *See—*
Woollen, J. Michael; and Knoblock, James O., 3,821,257.
Standard Oil Company, The: *See—*
Planz, Paul E., 3,821,348.
Stanford, George H. Spouts electrically heated gutters and down spouts. 3,821,512, Cl. 219-213.000.
Stanley, James M., to Multi-Systems, Inc. Apparatus for fabricating a structural frame in horizontal position. 3,820,704, Cl. 227-110.000.
Stant Manufacturing Company, Inc.: *See—*
Friend, Dawson, 3,820,680.
Stanyer, William R.: *See—*
Junes, Norman E.; and Stanyer, William R., 3,820,663.
Staples, Paul R.; and Dooley, James A., to General Electric Company. Dual range hydraulic thermostatic control service. 3,821,681, Cl. 337-319.000.
Star-New Era, Inc.: *See—*
Sinnott, David J.; and Alecci, Donald E., 3,821,753.
Starr, Carrol Dean; and Wang, Teh Po, to Driver, Wilbur B., Company. Nickel-silicon-magnesium alloy. 3,820,983, Cl. 75-170.000.
State of California, Department of Public Works: *See—*
Ammon, Harry C., 3,820,718.
State of Isreal, Ministry of Defence, The: *See—*
Popper, Jakhin Boaz; and Ashkenazi, Arie, 3,820,199.
Stauber, Siegfried, to Osswald, E., Firma. Method for roasting and cooling granular matter such as coffee. 3,821,450, Cl. 426-467.000.
Stauffer Chemical Company: *See—*
Gallagher, Ruth, 3,821,329.
Weil, Edward D., 3,821,336.
Stavis, Gus, to Singer Company, The. Velocimeter with improved signal to noise ratio. 3,820,896, Cl. 356-28.000.
Stavropoulos, Napoleon: *See—*
Reeves, Robert C.; Mansky, Michael; Stavropoulos, Napoleon; Kaleda, William W.; and Richards, William J., 3,821,430.
Stearns, George W., to Wagner Electric Corporation. Control valve and system. 3,820,854, Cl. 303-9.000.
Steers, Thomas Grant. Bicycle locking apparatus. 3,820,662, Cl. 211-5.000.
Steffen, Jurg; and Lortscher, Hans-Peter, to Pierres Holding SA. Resonator device for the production of laser beams. 3,821,661, Cl. 331-94.50c.
Steiner, Karl, to Licentia Patent-Verwaltungs-G.m.b.H. Color tube having funnel shield attached to shadow mask frame. 3,821,583, Cl. 313-407.000.
Steiner, Karl Ulrich: *See—*
Schoenauber, Wolfgang; and Steiner, Karl Ulrich, 3,821,262.
Steinle, Melvin E.: *See—*
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Stenberg, Erik Gunnar; and Emanuelsson, Ernst Ingemar, to Aktiebolaget Karlstads Mekaniska Werkstad. Forming roll for twin wire papermaking with axially aligned wave-shaped ribs. 3,821,076, Cl. 162-301.000.
Stendel, Wilhelm: *See—*
Enders, Edgar; Stendel, Wilhelm; Meier, Jurgen-Dietrich; and Francque, Marc, 3,821,204.
Stephen, John F. Aromatic diimides of 3,5-dialkyl-4-hydroxyphenyl-substituted amines. 3,821,161, Cl. 260-45.80n.
Stephenson, Robert L., to Allied Chemical Corporation. Slip tongue with inflator band. 3,820,842, Cl. 297-389.000.
Stepper, Heinz-J: *See—*
Sell, Heinz G.; and Stepper, Heinz-J, 3,820,868.
Sternung, Sven Y.; and Cowden, Earl T., to North Electric Company. Time sharing of a supervisory receiver unit. 3,821,484, Cl. 179-18.0eb.
Stevens, Henry C.: *See—*
Doran, Thomas J., Jr.; and Stevens, Henry C., 3,821,133.
Stevens, Joseph E.: *See—*
Hall, George B., Jr.; and Stevens, Joseph E., 3,820,494.
Stevenson, Timothy John; and Yardy, Raymond. Servo system for positioning data transducer. 3,821,804, Cl. 360-77.000.
Stevenson, Warren H.: *See—*
Mikhail, Edward M.; Stevenson, Warren H.; Kurtz, Maurice K., Jr.; and Balasubramanian, N., 3,820,895.
Stewart, C. Jim, & Stevenson, Inc.: *See—*
Baugh, Hollis A., 3,820,600.
Stierlin, Hans. Absorption-refrigeration plant with auxiliary gas. 3,820,356, Cl. 62-490.000.
Stigler, Anton, to Olin Energy Systems Ltd. Particulate material pressing apparatus. 3,820,934, Cl. 425-405.00h.
Stingl, Hans Alfred, to Toms River Chemical Corporation. Nitrodiphenylamine dyestuffs. 3,821,200, Cl. 260-239.700.
Stipanov, Jerome A. Fish ejector system. 3,820,342, Cl. 61-21.000.
Stomph, Joannes Gerardus, to Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid. Method and device for cutting split film. 3,820,427, Cl. 83-18.000.
Stone & Webster Engineering Corporation. *See —*
Woebcke, Herman N., 3,820,955.
Stone, Alan J., to Stone Conveyor, Inc. Variable bore clearance bearing. 3,820,860, Cl. 308-27.000.
Stone Conveyor, Inc.: *See—*
Stone, Alan J., 3,820,860.
Stone, John F., 20% to Lee, Raymond, Organization, Inc., The. Pipe cleaning device. 3,820,184, Cl. 15-104.040.
Stone, Theodore M. Self-gripping level. 3,820,249, Cl. 33-347.000.

Stonner, Hans-Martin; and Kraus, Erhard, to Metallgesellschaft Aktiengesellschaft. Separator for liquid—liquid extractors. 3,820,954, Cl. 23-267.00r.

Strang, Samuel J., to Injection Plastic Co., Inc., The. Self-aligning bearing member. 3,820,861, Cl. 308-72.000.

Stratton, Donald W.: *See—*
Moorhead, John P.; and Stratton, Donald W., 3,820,188.

Strazza, Richard W.; and Mohrhauser, John P. Single-button manipulation mechanism for use in locks and switches. 3,820,362, Cl. 70-306.000.

Streck, Roland; Nordsiek, Karl-Heinz; Weber, Heinrich; and Meyer, Klaus, to Chemische Werke Huls Aktiengesellschaft. Process for the production of copolyalkenamers. 3,821,328, Cl. 260-884.000.

Streeter, John H.; and Jenkins, Roger M., to Revenue Systems Limited. Clutch mechanisms. 3,820,407, Cl. 74-112.000.

Streib, Hugo: *See—*
Dietzel, Karl; Peilstocker, Gunter; Meyer, Karl-Heinrich; and Streib, Hugo, 3,821,071.

Strickland, Raymond I.; and Looger, Lonnie L., to United States of America, Army. Spherical head tripod. 3,820,751, Cl. 248-181.000.

Strimbling, Semen Itskhovich: *See—*
Andreev, Oleg Semenovich; Birjukov, Boris Konstantinovich; Byzov, Yury Mikhailovich; Lekhtman, Moisei Abramovich; Perelberg, Azik Iosifovich; Strimbling, Semen Itskhovich; Trachevsky, Boris Sergeevich; Fikhman, Isak Berovich; Cherepakha, Pavel Andreevich; nd Shraifeld, Tamara Yakovlevna, 3,821,749.

Stubbs, Peter William Robert; and Crouch, Stephen John, to Rover Company Limited, The. Vehicle suspension systems. 3,820,812, Cl. 280-104.000.

Stuetz, Peter: *See—*
Fehr, Theodor; Stuetz, Peter; and Stadler, Paul, 3,821,226.

Sturm, Elmar; and Vogel, Christian, to Ciba-Geigy Corporation. Control of weeds with N-carbenyl derivative of azabicyclooctanes. 3,820,974, Cl. 71-94.000.

Sturm, Elmar; and Menasse, Raphael, to Ciba-Geigy Corporation. N-(Substituted phenyl)-2,3-dichloromaleimides. 3,821,247, Cl. 260-326.50s.

Sturm, Konrad, to Diehl Datensysteme GmbH. Magnet arrangement for data processing devices. 3,821,672, Cl. 335-266.000.

Sturtevant,: *See—*
Harrington, Richard John; Low, Arnold Edward; and Sturtevant,, 3,821,485.

Stut, Hans, to Siemens Aktiengesellschaft. Apparatus for the control of electrical heating. 3,821,515, Cl. 219-497.000.

Styron, James S.; and Mandy, Zolian, to Carrier Corporation. Sludge separation system. 3,820,349, Cl. 62-58.000.

Su Crest Corporation: *See—*
Monti, Anthony, 3,821,414.

Suchane, David V., to Kimberly-Clark Corporation. Method of coating a tampon with an insertion aid. 3,821,350, Cl. 264-257.000.

Suchy, Milos: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,821,284.

Suda, Toshi; and Isomura, Takuji, to Nippondense Co. Ltd. Pneumatic RPM regulator for fuel injection pumps. 3,820,519, Cl. 123-140.0mp.

Sudo, Michio, to Mitsubishi Yuka Kabushiki Kaisha. Manufacturing method of thermoplastic synthetic resin films. 3,821,343, Cl. 264-89.000.

Sugafuji, Akira: *See—*
Abe, Wataru; Terada, Yasuyuki; and Sugafuji, Akira, 3,821,111.

Sugano, Katsumi; Ikegami, Yoshio; and Kimura, Hirohumi, to Kobe Steel, Ltd. and Sumitomo Electric Industries, Ltd. Softening apparatus in tandem electric wire manufacture. 3,821,511, Cl. 219-155.000.

Sugawara, Katsuro: *See—*
Sugita, Yoshimitsu; Kato, Teruo; Sugawara, Katsuro; and Tamura, Masao, 3,821,783.

Sugihara, Yasumasa; and Takayama, Mitsutaka. Colour television receiver. 3,821,792, Cl. 358-35.00r.

Sugita, Yoshimitsu; Kato, Teruo; Sugawara, Katsuro; and Tamura, Masao, to Hitachi, Ltd. Semiconductor device with a silicon monocrystalline body having a specific crystal plane. 3,821,783, Cl. 357-60.000.

Sugiura, Takahisa; Arai, Nobuyasu; Kato, Takashi; and Hotta, Hiroshi, to Sumitomo Chemical Company, Limited. Fiber treating agents. 3,821,172, Cl. 260-78.50r.

Suhault, Jacques: *See—*
Regnier, Gilbert; Canevari, Roger; and Suhault, Jacques, 3,821,225.

Sumitomo Chemical Company, Limited: *See—*
Ogino, Shigeo; Kishimoto, Fumitaka; and Wada, Hiroo, 3,821,203.
Sugiura, Takahisa; Arai, Nobuyasu; Kato, Takashi; and Hotta, Hiroshi, 3,821,172.

Sumitomo Chemical Company, Ltd.: *See—*
Katsuda, Yoshio; and Ohno, Takashi, 3,821,260.
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 3,821,404.

Sumitomo Electric Industries, Ltd.: *See—*
Sugano, Katsumi; Ikegami, Yoshio; and Kimura, Hirohumi, 3,821,511.

Sumiyoshi, Koichiro, to Sony Corporation. Magnetic recording and reproducing apparatus which prevents erasing during tape loading. 3,821,799, Cl. 360-60.000.

Summe, Richard D.; and Vannoy, Everett H. Overload circuit breaker. 3,821,679, Cl. 337-101.000.

Sun Research and Development Co.: *See—*
Shang, Jer-Yu; and Hansel, William B., 3,821,660.

Sunbeam Corporation: *See—*
Brunning, Elmer Eugene; Grover, Donald P.; Schild, Manfred; and Nickelson, Robert William, 3,820,808.

Sundblom, Leif J.; and Ollivier, Louis A., to Veriflo Corporation. Ventilator. 3,820,566, Cl. 137-624.140.

Sundqvist, Cnut: *See—*
Mansson, Ragnar; Nilsson, Lars; Noberius, Leif; and Sundqvist, Cnut, 3,821,078.

Sunkist Growers Inc.: *See—*
Swisher, Horton E., 3,821,449.

Suntory Ltd.: *See—*
Kosano, Yoshiyasu; Nakajima, Shin; and Yagiu, Masaru, 3,821,418.

Superior Manufacturing Company: *See—*
Dorn, Chester, 3,820,800.

Superior Oil Company, The: *See—*
Weichman, Bernard E., 3,821,353.

Sutton, Blaine M., to Smithkline Corporation. 4-Cyclohexylvulpinic acid derivatives in the treatment of arthritis. 3,821,397, Cl. 424-279.000.

Sutton, Blaine M., to Smithkline Corporation. Substituted 2,5-diphenyl-3,4,6-trihydroxy-delta 2,4-hexadiemoic acid lactones (1,4) in the treatment of arthritis. 3,821,398, Cl. 424-279.000.

Sutton, Joel F.: *See—*
Anders, Larry E.; and Sutton, Joel F., 3,820,720.

Suzuki, Masao: *See—*
Akashi, Hajime; Iwai, Sosuke; Fujimoto, Iwao; Hashimoto, Hiroshi; Abe, Tetsuo; Kato, Akira; and Suzuki, Masao, 3,820,623.

Suzuki, Norihiro; and Takizawa, Kazuyuki, to Sony Corporation. Phonograph record changer. 3,820,797, Cl. 274-10.00s.

Suzuki, Shigekazu: *See—*
Shiguma, Heijiro; and Suzuki, Shigekazu, 3,820,373.

Suzuki, Takahiro; and Ota, Yoshihiko, to Victor Company of Japan, Ltd. System for recording and reproducing a wide-band signal. 3,821,797, Cl. 360-24.000.

Svala, Carl Gunnar, to North Electric Company. Automatically compensated permeameter. 3,821,637, Cl. 324-34.0pe.

Swartz, Edwin H. Scrap metal recovery method and apparatus. 3,821,026, Cl. 134-2.000.

Swedelius, Joseph B. Coupling for connecting aligned tubes. 3,820,831, Cl. 285-367.000.

Sweeney, Richard F.: *See—*
Anello, Louis G.; and Sweeney, Richard F., 3,821,290.

Swered, Paul: *See—*
Brink, Robert H., Jr.; Shema, Bernard F.; and Swered, Paul, 3,821,369.

Swett, James B.; and Smith, Sidney Z., to Dart Industries Inc. Food shaker and blender. 3,820,692, Cl. 222-547.000.

Swett, Leo Ralph: *See—*
Paris, Gerard Yvon; and Swett, Leo Ralph, 3,821,391.

SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH: *See—*
Ade, Rolf; and Gakenholz, Werner, 3,821,621.

Swift & Company: *See—*
Lewis, Morton, 3,821,263.
Lewis, Morton, 3,821,335.

Swisher, Horton E., to Sunkist Growers Inc. Method of dehydrating citrus peel. 3,821,449, Cl. 426-438.000.

Swisstone Corporation: *See—*
Fishbfin, Harry, 3,820,432.

Switchcraft, Inc.: *See—*
Bailey, James R., 3,821,533.

Syntex (U.S.A.) Inc.: *See—*
Crabbe, Pierre; and Fried, John H., 3,821,288.
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,821,252.

Syntex Corporation: *See—*
Fried, John H.; and Harrison, Ian T., 3,821,253.

Syntex(U.S.A.) Inc.: *See—*
Pfister, Jurg R.; Harrison, Ian T.; and Fried, Jean H., 3,821,251.

Szedon, John R.; Jackson, John A.; and Phillips, David C., to Westinghouse Electric Corporation. Process for producing encapsulated solid state electronic devices having a sealed lead-encapsulant interface. 3,821,099, Cl. 204-181.000.

Szpur, Roman, to NDM Corporation, mesne. Medical electrode. 3,820,531, Cl. 128-2.06e.

Tabernacki, Harry A., to Kraftco Corporation. Apparatus for distributing particulate material. 3,820,503, Cl. 118-24.000.

Tabor, James B.: *See—*
Kappenhagen, George A.; and Tabor, James B., 3,821,601.

Tahara, Kumeo, to Alps Motorola, Inc. Two-channel and four-channel auto-selector device for cartridge-type tape players. 3,820,796, Cl. 360-94.000.

Takahashi, Toshikatsu: *See—*
Okamura, Eijiro; and Takahashi, Toshikatsu, 3,821,445.

Takamatsu, Ikuo, to Yosida Kogyo Kabushiki Kaisha. Slider-operated zip fasteners. 3,820,202, Cl. 24-205.10c.

Takamatsu Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Locking sliders. 3,820,203, Cl. 24-205.14a.

Takayama, Mitsutaka: *See—*
Sugihara, Yasumasa; and Takayama, Mitsutaka, 3,821,792.

Takechi, Kaoru; Yamada, Shoji; and Ishiguro, Chiaki, to Murata Kikai Kabushiki Kaisha. Apparatus for abrading and refining foundry. 3,820,726, Cl. 241-102.000.

Takeda, Masashi; and Kikuchi, Masafumi, to Sony Corporation. Transistor circuit for the driver stage of a class B amplifier. 3,821,656, Cl. 330-15.000.

Takeda, Toshio: *See—*
Tomisawa, Norio; Uchiyama, Yasuji; Okumaru, Takatoshi; and Takeda, Toshio, 3,821,714.

Takei, Hiromichi, to Nihon Shinku Gejutsu Kabushiki Kaisha (Culvac Corporation en England). Apparatus for sweeping the beam from a plasma electron gun on the surface of a mold of a continuous ingot casting device. 3,820,586, Cl. 164-250.000.

Takeichi, Yoshihiro: *See—*
Mizusawa, Motoo; Takeichi, Yoshihiro; and Betsudan, Shinichi, 3,821,746.

Takenaka, Senji: *See—*
Shiraishi, Hipoo; Kurohara, Hiroyoshi; Tomita, Shinjiro; Takenaka, Senji; Yamada, Nobuo; and Hashitani, Motoyoshi, 3,820,353.

Takizawa, Kazuyuki: *See—*
Suzuki, Norihiro; and Takizawa, Kazuyuki, 3,820,797.

Tamag Basel AG: *See—*
Buchmann, Paul; and Beringer, Monique, 3,820,548.

Tamai, Yasuo: *See—*
Fukushima, Osamu; Sato, Masamichi; and Tamai, Yasuo, 3,820,986.

Tamura, Masahiko; Iwama, Kiyonori; Yamaguchi, Akira; and Asahina, Mitsuo; deceased (by Asahina, Toshiro; legal representative), to Pioneer Electronic Corporation. Electret transducer having two diaphragms. 3,821,492, Cl. 179-111.00e.

Tamura, Masao: *See—*
Sugita, Yoshimitsu; Kato, Teruo; Sugawara, Katsuro; and Tamura, Masao, 3,821,783.

Tan, Yen T.; Khosla, Rajinder P.; Fischer, John R.; and Ranadive, Deepak K., to Eastman Kodak Company. Method of sensitizing zinc telluride. 3,820,988, Cl. 96-1.500.

Tanaka, Masashi, to Fuji Jidoki Kabushiki Kaisha. Automatic package binding machine. 3,820,451, Cl. 100-4.000.

Tanaka, Nobuo: *See—*
Kubotera, Haruo; Hashimoto, Yukio; Ohkubo, Masuta; Gonda, Hisashi; Tanaka, Nobuo; Matsudo, Kazuo; and Shimomura, Takayoshi, 3,821,031.

Tanaka, Yoshihiro: *See—*
Nakamura, Yasushi; Agatsuma, Kunio; Tanaka, Yoshihiro; and Aono, Shunji, 3,821,404.

Taniguchi, Kenji; Imaizumi, Ichiro; and Hotta, Atsuo, to Hitachi, Ltd. Semiconductor memory. 3,821,719, Cl. 340-173.00f.

Taniuchi, Akira; and Nakano, Takuji, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Flame retarding halogenated compounds. 3,821,316, Cl. 260-615.00d.

Tank, Eggert; and Tiefenbacher, Eberhard, to Daimler-Benz Aktiengesellschaft. Heat-exchanger. 3,820,595, Cl. 165-83.000.

Tantraporn, Wirojana: *See—*
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Tanzer, John. Method of attaching plate members to each other. 3,821,052, Cl. 156-250.000.

Tarasova, Ljudmila Viktorovna: *See—*
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Tarbox, Elmer L. Head weight and method of use. 3,820,780, Cl. 272-57.00r.

Tarui, Yasuo: *See—*
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Tashiro, Mitsuru: *See—*
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Taylor, David L. Golf swing training device. 3,820,795, Cl. 273-186.00a.

Taylor, Richard F., to Anglo-Transvaal Consolidated Investment Company. Stope mining machinery having free swinging hammers. 3,820,846, Cl. 299-1.000.

Taylor, Richard John: *See—*
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Taylor, Robert C.; Koncos, Robert; and Meyers, Joseph A., III, to Atlantic Richfield Company. Fire retardant polyurethane compositions. 3,821,067, Cl. 161-67.000.

Taylor, Roger W.: *See—*
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Taylor, William K., Jr.: *See—*
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McNeill, Frank M., 3,820,732.

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Karlstedt, Sten Lennart, 3,821,465.

Tempcraft Tool & Mold, Inc.: *See—*
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Temple, Ralph E., to Diamond Shamrock Corporation. Silicated soda ash. 3,821,119, Cl. 252-135.000.

Tennant Company: *See—*
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Tenneco Chemicals, Inc.: *See—*
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Gilchrist, Ralph E.; and Cox, Jack C., 3,821,109.

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Tenta, Louis T. Topical composition for treating seborrheic keratosis. 3,821,370, Cl. 424-145.000.

Terada, Yasuyuki: *See—*
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Terayama, Fusaji, to Morita Fire Pump Mfg. Co., Ltd. High altitude breaking apparatus for fire fighting. 3,820,606, Cl. 169-2.500.

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Texaco Inc.: *See—*
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Thackston, Thomas. Packaged syringe construction. 3,820,652, Cl. 206-365.000.

Thayer, Paul G., to Westinghouse Electric Corporation. Tuned exhaust for hermetic compressor. 3,820,921, Cl. 417-312.000.

Therachemie Chemisch Therapectische Gesellschaft m.b.H.: *See—*
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Thiesen, Josef Jakob. Cutting device for large pieces of soft foodstuffs. 3,820,194, Cl. 17-32.000.

Thomann, Helmut, to Siemens Aktiengesellschaft. Process and apparatus for the production of propagating electric alternating fields. 3,821,667, Cl. 333-30.00r.

Thomas, Jerry D.; and Griffith, Cecil B., to Republic Steel Corporation. Method of adding lead to steel with lead oxide slag. 3,820,982, Cl. 75-129.000.

Thompson, Granville B.; and Seeley, Robert D., said Thompson assor. to University of Missouri, The Curators of the and said Seeley assor. to Anheuser-Busch Incorporated. Dried brewers grain in high energy animal feeds. 3,821,416, Cl. 426-2.000.

Thompson, Lloyd G. Hub and drum balancing machine. 3,820,403, Cl. 73-480.000.

Thompson, Richard M., to Hughes Aircraft Company. Waveguide alignment and quick disconnect coupler. 3,821,670, Cl. 333-98.00r.

Thompson, Wallace M., to Harris Press & Shear Corporation. Wide throat scrap shear. 3,820,426, Cl. 83-13.000.

Thomson-CSF: *See—*
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Neuers, Lucien, 3,820,816.

Thorp, James T., Jr., to Champion Hoist Company. Hoist. 3,820,633, Cl. 187-95.000.

Threshold Technology Inc.: *See—*
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Thurston, Glenn C., to Gulf Oil Corporation. Fastener system and method for inspecting same. 3,820,381, Cl. 73-40.000.

Tidball, Robert A.; and Lauro, Gene F., to Foster Wheeler Corporation. Method of treating boiler make-up water. 3,820,333, Cl. 60-667.000.

Tiefenbacher, Eberhard: *See—*
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Tillotson, Neil E.; and Consoli, Sebastian A., to Tillotson Corporation. Carpet and method of making. 3,821,066, Cl. 161-67.000.
Timmey, William: *See—*
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Timmler, Helmut; Draber, Wilfried; Buchel, Karl Heinz; and Plempel, Manfred. Antimycotic compositions and method employing α-substituted benzyl-azoles. 3,821,394, Cl. 424-273.000.
Tippetts, Earl Levell, to Lear Avia Corporation. Altitude alerting system. 3,821,698, Cl. 340-27.0na.
Tipton, Lee. Bale orienting mechanism. 3,820,453, Cl. 100-188.00r.
Titovi Zovodi Litostroj: *See—*
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Titterington, William Alexander; and Milgate, Robert White, Jr., to General Electric Company. Kipp type gas generator with movable liquid reactant exit port. 3,820,956, Cl. 23-282.000.
Tiura, George O.: *See—*
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Tominaga, Hiroshi; and Adachi, Kohei. Hydraulic press. 3,820,369, Cl. 72-55.000.
Tomisawa, Norio; Uchiyama, Yasuji; Okumaru, Takatoshi; and Takeda, Toshio, to Nippon Gakki Seizo Kabushiki Kaisha. Musical tone wave shape generating apparatus. 3,821,714, Cl. 340-172.500.
Tomita, Sadami; Hosoya, Akira; and Okagaki, Hiroshi, to Hitachi, Ltd. Light source lamp cathode for atomic light absorption analysis formed by compressing powder of Cd_3Cu with one of the powders of Pb_2Ba, Pb_2Ca or Pb_2Sn. 3,820,487, Cl. 313-209.000.
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Toms River Chemical Corporation: *See—*
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Topol, Leo E.; and Raleigh, Douglas O., to Rockwell International Corporation. Method for directly measuring NO_2 in air. 3,821,090, Cl. 204-1.00t.
Topolyansky, Jury Arnoldovich: *See—*
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Tull, Russell F. Molded foam decorative devices and process for manufacture thereof. 3,821,341, Cl. 264-51.000.
Tuomala, Matt E. Convertible ice house-snow sled combination. 3,820,805, Cl. 280-12.00s.
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National Aeronautics and Space Administration; Administrator; with respect to an invention of:
Appleberry, Walter T. Device for measuring tensile forces. 3,820,388, Cl. 73-141.00a.
Griffin, Richard N.; and McCreight, Louis R. Apparatus for conducting flow electrophoresis in the substantial absence of gravity. 3,821,102, Cl. 204-299.000.
Navy: *See—*
Baker, Donald James, Jr.; Hill, Ivan Winfield; and Wearn, Richard B., Jr., 3,820,391.
Campbell, Kenneth J., 3,821,648.
Dixon, Lewis C., 3,820,464.
Jernigan, James L., 3,821,548.
Kuck, John H.; and Staake, Donal B., 3,821,736.
Leonard, Guy W.; and Ross, Hubert M., Jr., 3,820,463.
Lipscomb, Charles A., Jr.; and Smith, Treva M., 3,821,120.
Loos, John C., 3,821,751.
McEwan, William S.; and Drew, Charles M., 3,820,953.
McKelvey, James F., 3,821,752.
Pocock, Walter E., 3,821,530.
Sippel, Nathan J., 3,821,043.
Warren, Samuel C., 3,821,563.
United States Steel Corporation: *See—*
Boto, Louis; and Rodger, David B., 3,820,947.
Cutton, John G., 3,820,372.
Katunich, Samuel; and McKelvey, George C., 3,820,230.
Snow, Roland B., 3,820,770.
Spaeder, Carl E., Jr., 3,820,212.
Univeristy of California, The Regents of the: *See—*
Heald, David L.; and Holm-Kennedy, James W., 3,821,784.
Universal Oil Products Company: *See—*
Germanas, Dalia; and Pollitzer, Ernest L., 3,821,123.
Massie, Stephen N.; and Bloch, Herman S., 3,821,315.
Mitsche, Roy T.; Hayes, John C.; Wilhelm, Frederick C.; and Rausch, Richard E., 3,821,105.
University of California, Regents of the: *See—*
Brown, William D., 3,821,438.
University of Missouri, The Curators of the: *See—*
Thompson, Granville B.; and Seeley, Robert D. (said Thompson assor. to), 3,821,416.
Uno, Naoyuki: *See—*
Urano, Fumio; Uno, Naoyuki; Nomura, Katsuhiko; Watanabe, Koichiro; Sakazaki, Tadazumi; and Miyata, Katsuhiko, 3,821,768.
Upjohn Company, The: *See—*
Argoudelis, Alexander D.; and Johnson, LeRoy E., 3,821,367.
Barber, Patrick A.; and Cleveland, Bruce B., 3,820,605.
Beal, Philip F., III; and Pike, John E., 3,821,280.
Colins, Robert J., 3,821,388.
Hall, Charles M.; and Johnson, Herbert G., 3,821,227.
Kaugars, Girts, 3,821,261.
Kelly, Robert C., 3,821,255.
Lincoln, Frank H., Jr.; and Pike, John E., 3,821,291.
Urai, Masaaki: *See—*
Fukuzuka, Toshio; Murakami, Tsuyoshi; Urai, Masaaki; and Sakaguchi, Mitutoshi, 3,820,368.
Urano, Fumio; Uno, Naoyuki; Nomura, Katsuhiko; Watanabe, Koichiro; Sakazaki, Tadazumi; and Miyata, Katsuhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Viewfinder shield in a single lens

reflex camera adopting a TTL light measuring method. 3,821,768, Cl. 354219.000.

U.S. Philips Corporation: *See*—
Beale, Julian Robert Anthony, 3,821,774.
Habelt, Gerhard, 3,821,816.
LaGrouw, Coenraad Maria, 3,821,004.
Quirijnen, Marius, 3,820,700.
Walraven, Anthonie, 3,821,604.
Weinhardt, Erolf; and De Wit, Cornelis Leendert, 3,820,596.
Westendorp, Frans Frederik; Luiten, Willem; and De Kort, Gijsbertus Maria Arnolds Josephus, 3,821,034.

U.S. Phillips Corporation: *See*—
Hermeyer, Bernd, 3,821,552.

Uskokovic, Milan Radoje; and Williams, Thomas Henry, to Hoffmann-La Roche Inc. 11-Substituted-desa-pregnanes and derivatives thereof. 3,821,271, Cl. 260-456.00r.

USM Corporation: *See*—
Schaefer, Hans F., Jr.; and France, David W., 3,821,498.

Usuda, Koji, to Hitachi, Ltd. Semiconductor device with high conductivity and high resistivity collector portions to prevent surface inversion. 3,821,779, Cl. 357-34.000.

Utility Tool Corporation: *See*—
Matthews, James J., 3,820,420.

Utter, Robert P.: *See*—
Kohl, Vance L.; and Utter, Robert P., 3,820,354.

Uwe-Unterwasser-Electric GmbH & Co. KG: *See*—
Weller, Elmar, 3,820,173.

Vaillant, Joh., K.G.: *See*—
Sohnchen, Ernst; and Feldmann, Ernst, 3,821,675.

Valenta, Joseph R.: *See*—
Fare, Louis R.; Goore, Moshe; Naylor, James F., III; and Valenta, Joseph R., 3,821,193.

Van Anrooy, Peter H., to Motorola, Inc. Wideband discriminator circuit with improved operating characteristics. 3,821,654, Cl. 329-103.000.

Van Benschoten, Peter J., to Oak Industries Inc. Pushbutton switch latching mechanism. 3,821,528, Cl. 200-153.00j.

van den Houte, Jozef Willy: *See*—
Mertens, Ludovicus Lucas; van den Houte, Jozef Willy; and van Royen, Freddy Ghisleen, 3,820,995.

van der Lely, Cornelis; and Nieuwenhover, Hendricus Jacobus Cornelis. Production lines for the manufacture of pre-fabricated buildings. 3,820,216, Cl. 29-200.00a.

Van Der Meer, Leonardus Petrus, to N.V. Leidsche Apparatenfabriek. Cap supply mechanism for a rotating bottle closing device. 3,820,305, Cl. 53-308.000.

van der Vliet, Cornelis, to Hoogovens Ijmuiden B.V. Shaft furnace with evaporation cooling. 3,820,509, Cl. 122-6.00r.

Van Deventer, Arthur J.; and Poland, David R., to Dart Industries Inc. Glove inspection apparatus. 3,820,383, Cl. 73-41.000.

Van Doorselaer, Marcel Karel; Danckaert, Valere Frans; and Benoy, Gaston Jacob, to Agfa-Gevaert, N.V. Process for producing photographic silver images. 3,820,991, Cl. 96-22.000.

van Helden, Robert: *See*—
Mulder, Albertus J.; and van Helden, Robert, 3,821,266.

Van Hook, Brewton O.: *See*—
Quesinberry, Elmen C.; Glover, Clarence C.; and Van Hook, Brewton O., 3,821,738.

Van Leemputten, Ekkerhard; and Horisberger, Marc, to Societe d'Assistance Technique pour Produits Nestle S.A. Preparation of immobilized enzymes. 3,821,083, Cl. 195-63.000.

van Royen, Freddy Ghisleen: *See*—
Mertens, Ludovicus Lucas; van den Houte, Jozef Willy; and van Royen, Freddy Ghisleen, 3,820,995.

Van Vliet, Cors, to N.V. Werktuigenfabriek Mulder. Air heater, especially for connection to a central heating system. 3,820,526, Cl. 126-110.00r.

Vanasse, Norman Alfred: *See*—
Enzie, William Howard; Vanasse, Norman Alfred; Tracy, Gerald Thomas; and Easton, Harry Thomas, 3,821,427.

Vanjushin, Sergei Petrovich; and Bandakov, Leonid Fedorovich. Dermatome with a reciprocable knife. 3,820,543, Cl. 128-305.000.

Vanlerberghe, Guy, to Societe Anonyme dite: L'Oreal. Emulsion containing oil, water and as emulsifier the polycondensation product of glycidal on alpha diols with fatty chain. 3,821,372, Cl. 424-170.000.

Vannoy, Everett H.: *See*—
Summe, Richard D.; and Vannoy, Everett H., 3,821,679.

Vargha, Laszlo; Horvath, Tibo; Halasz, Maria; Csanyi, Endre; and Dumdovich, Boris, to Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara RT. 2-Sulphonyloxy-ethylamino derivatives. 3,821,270, Cl. 260-456.00a.

Varian Associates: *See*—
James, Lawrence W., 3,821,777.
Polese, James P., 3,820,206.

Vasiliev, Vasily Vasilievich: *See*—
Alexandrovich, Eduard-Gely Vitalievich; Belkin, Nikolai Vasilievich; Zelensky, Konstantin Fedorovich; Kanunov, Mikhail Alexeevich; Razin, Anatoly Alexandrovich; Tarasova, Ljudmila Viktorovna; Toropov, Anatoly Pavlovich; Troshkin, Ivan Andreevich; Khudyakov, Ljubov Nikolaevna; Tsukerman, Veniamin Aronovich; Dron, Ninel Alexeevna; Sloeva, Galina Nikolaevna; Ioffe, Jury Konstantinovich; and Vasiliev, Vasily Vasilievich, 3,821,580.

Vasilieva, Tatyana Vsevolodovna: *See*—
Korshak, Vasily Vladimirovich; Andrianov, Kuzma Andrianovich; Gribova, Irina Alexandrovna; Krasnov, Alexandr Petrovich; Khananashvili, Lotary Mikhailovich; Vasilieva, Tatyana Vsevolodovna; Elerdashvili, Georgy Vasilievich; Gureeva, Galina Ilinichna; Kotov,Valery Mikhailovich; and Brontman, Rostislav Lazarevich, 3,821,112.

Vayssiere, Pierre, to Insitut de Recherches de la Siderugie Francaise (IRSID). Method and apparatus for treatment of gases. 3,820,510, Cl. 122-7.00r.

VEB Filmfabrik Wolfen: *See*—
Kaufman, Warner B.; and Breitwieser, Roland, 3,821,462.

VEB Pentacon Dresden Kamera- und Kinowerke: *See*—
Schulze, Heinz, 3,821,755.

Veb Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See*—
Hertrich, Klaus, 3,820,774.

Vedova, Ralph, to Motoren Turbinen-Union Munchen GmbH. Lift engine arrangement. 3,820,746, Cl. 244-55.000.

Veillard, George E., to Xerox Corporation. Vacuum stripping roll with rotary pickup slots. 3,820,778, Cl. 271-174.000.

Velasco: *See*—
Croset, Michel; and Velasco, 3,820,871.

Veltges, Helmut: *See*—
Franzen, Gustav; and Veltges, Helmut, 3,820,315.

Venable, Douglas: *See*—
Rogers, Benjamin T.; Taylor, Roger W.; and Venable, Douglas, 3,820,435.

Venables, Herbert J., III, to Venables Machine and Tool Company, The. Heat exchanger tube and apparatus for making same. 3,820,217, Cl. 29-202.00d.

Venables Machine and Tool Company, The: *See*—
Venables, Herbert J., III, 3,820,217.

Venturi, Gino: *See*—
Bennett, Melvin T.; Vlach, Thomas L.; Edwin, Allan I.; and Venturi, Gino, 3,821,706.

Verholt, Johannes Maria, to N.V. Meubelfabriek "Deco". Kit for assembling for example a piece of furniture, a partition or toys from panels and strips. 3,820,299, Cl. 52-752.00c.

Veriflo Corporation: *See*—
Ollivier, Louis A., 3,820,539.
Sundblom, Leif J.; and Ollivier, Louis A., 3,820,566.

Vernaleken, Hugo; Lange, Ralf; Schnell, Hermann; and Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for producing very pure tetra chlorobisphenol A. 3,821,294, Cl. 260-520.000.

Vestergaard, Jorgen H.: *See*—
Merritt, Will D., Jr.; and Vestergaard, Jorgen H., 3,821,325.

Vickers Limited: *See*—
Smith, Francis Hughes, 3,820,870.

Victor Company of Japan, Ltd.: *See*—
Suzuki, Takahiro; and Ota, Yoshihiko, 3,821,797.

Viehbach, Hans-Dieter: *See*—
Kraus, Werner; Lechner, Fritz; and Viehbach, Hans-Dieter, 3,820,534.

Vignes, Roger, to Gaz de France. Auto-stabilised gas-burner. 3,820,945, Cl. 431-349.000.

Vincent, David N.; and Chang, Cheng Hsiung, to Champion International Corporation. Bisfluoran chromogenic compounds, preparation thereof, and pressure-sensitive copy systems employing same. 3,821,010, Cl. 117-36.200.

Vincent, James Henry, to American Standard, Inc. Electrostatic precipitator employing dielectric grids. 3,820,306, Cl. 55-123.000.

Vinsani, Mario, to Honeywell Information Systems Italia. Device for testing the operation of sequential integrated circuital units. 3,821,645, Cl. 324-73.00r.

Violet, Jean-Louis: *See*—
Carron, Georges; and Violet, Jean-Louis, 3,821,093.

Virnik, Alexandr Davidovich: *See*—
Lishevskaya, Marina Osipovna; Virnik, Alexandr Davidovich; Gabrielian, Genrikh Aramaisovich; Rogovin, Zakhar Alexandrovich; Borbat, Vladimir Fedorovich; Orlov, Alexandr Mikhailovich; Ferberg, Mirriam Borisovna; and Markelova, Nina Ivanovna, 3,821,137.

Vitti, Rudolf A.: *See*—
Jolly, Michael P.; Quellette, Norman P.; Vitti, Rudolf A.; and Pinzone, Salvatore M., 3,821,429.

Vlach, Thomas L.: *See*—
Bennett, Melvin T.; Vlach, Thomas L.; Edwin, Allan I.; and Venturi, Gino, 3,821,706.

Vockroth, William J. Swimming pool cleaner. 3,820,182, Cl. 15-1.700.

Vogel, Christian: *See*—
Sturm, Elmar; and Vogel, Christian, 3,820,974.

Volfson, Izrail Mordukhovich: *See*—
Chernyshev, Petr Sergeevich; Spiridonov, Konstantin Alexeevich; Pakhomov, Vladimir Alexandrovich; Nikolaev, Georgy Vasilievich; Volfson, Izrail Mordukhovich; Levchenko, Boris Leonidovich; Ryzhkov, Viktor Kuzmich; Gladkovsky, Petr Stanislavovich; Shargorodsy, Viktor Semenovich; and Shlyapin, Alexandr Nikolaevich, 3,820,915.

Volkswagenwerk Aktiengesellschaft: *See*—
Delf, Gerhard; and Schommarz, Gunther, 3,820,938.
Hofbauer, Peter, 3,820,926.

Vollrath, Robert; Boell, Walter; Scheuerer, Guenter; and Adolphi, Heinrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. 2,3-Dihydrobenzofuranylmethyl chrysanthemic esters. 3,821,256, Cl. 260-346.20r.

Von Fange, Wilbur H., to McDonnell Douglas Corporation. Means for testing the operation of collision avoidance systems. 3,821,739, Cl. 343-17.700.

Von Meyer, William C.: *See—*
Bayer, Horst O.; Cook, Richard S.; and Von Meyer, William C., 3,821,376.

Vooght, Frank. Under water camera box. 3,821,759, Cl. 354-64.000.

Vorontsov, Anatoly Konstantinovich: *See—*
Bogrets, German Nikolaevich; Semenov, Oleg Alexeevich; Dudkin, Vyacheslav Fedorovich; and Vorontsov, Anatoly Konstantinovich, 3,820,969.

Vykhodov, Nikolai Ivanovich: *See—*
Nikiforov, Vladimir Pavlovich; Nosikov, Vasily Ivanovich; Kil, Ilya Genrikhovich; Tsybukov, Igor Kirillovich; Smorodinov, Alexandr Nikolaevich; Tsyplakov, Anatoly Mikhailovich; Budkevich, Nikolai Pavlovich; and Vykhodov, Nikolai Ivanovich, 3,821,101.

Wada, Eiichi; and Ono, Yoshio, to Pioneer Electronic Corporation. Tape cartridge adaptor unit. 3,821,808, Cl. 360-94.000.

Wada, Hiroo: *See—*
Ogino, Shigeo; Kishimoto, Fumitaka; and Wada, Hiroo, 3,821,203.

Wadler, Milton: *See—*
Frey, Gerald J.; Wadler, Milton; and Harrison, Paul H., 3,820,886.

Wagensonner, Eduard: *See—*
Wagner, Karl; and Wagensonner, Eduard, 3,821,765.

Wagner Electric Corporation: *See—*
Stearns, George W., 3,820,854.

Wagner, Gerhard; and Kinzel, Walter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Bridge laying device. 3,820,181, Cl. 14-1.000.

Wagner, Karl; and Wagensonner, Eduard, to Agfa-Gevaert Aktiengesellschaft. Photographic arrangement with viewfinder indication of flash readiness. 3,821,765, Cl. 354-128.000.

Wagner, William, to Watsco, Inc. Dispensing valve. 3,820,564, Cl. 137-612.100.

Wahl, Karl-Heinz, to Bosch, Robert, G.m.b.H. Digital electronic approximative function tracing method and apparatus. 3,821,524, Cl. 235-151.000.

Wainer, Eugene: *See—*
Lewis, James M.; and Wainer, Eugene, 3,820,993.

Wakefield, Shirley L.; and Lambert, Vernon L., to Cincinnati Electronics Corporation, mesne. Formations of shallow P-N junctions in Pb Sn Te by direct diffusion. 3,821,040, Cl. 148-189.000.

Walden, John P.: *See—*
Kornrumpf, William P.; Walden, John P.; and Walker, Loren H., 3,821,630.

Waldon, Vernon L., to Ingress Manufacturing Co., Inc. Quick change hinge assembly. 3,820,175, Cl. 4-236.000.

Walker, George E., Jr.; and Hemphill, Dean P., to Shell Oil Company. Well capping device. 3,820,601, Cl. 166-55.000.

Walker, Loren H.: *See—*
Kornrumpf, William P.; Walden, John P.; and Walker, Loren H., 3,821,630.

Walkling, Peter: *See—*
Halasz, Istvan; Otto, Hans; Gutlich, Karl Friedrich; and Walkling, Peter, 3,820,660.

Wallace, Gary Leonard: *See—*
Marshall, Robert Howard; and Wallace, Gary Leonard, 3,820,428.

Walraven, Anthonie, to U.S. Philips Corporation. Arrangement for synchronizing two signals. 3,821,604, Cl. 317-5.000.

Walsh, John J.; and Litteral, Carl J., to Union Carbide Corporation. Block copolymer compositions having improved cloud points. 3,821,122, Cl. 252-353.000.

Walter, Siegfried; and Schindewolf, Ulrich, to Friedrich Uhde GmbH. Process for the recovery of deuterium from hydrogen-rich gas. 3,821,361, Cl. 423-648.000.

Walus, Aloysius N., to Du Pont de Nemours, E. I., and Company. Aqueous coating composition of an acrylic graft copolymer, a linear acrylic polymer and a cross-linking agent. 3,821,145, Cl. 260-29.4ua.

Wamser, Christian A.: *See—*
Bandyopadhyay, Bhaskar; Bruen, Charles P.; and Wamser, Christian A., 3,821,355.

Wang, Teh Po: *See—*
Starr, Carrol Dean; and Wang, Teh Po, 3,820,983.

Wanka, Eberhard: *See—*
Aidn, Martin; Furtwangler, Gerhard; and Wanka, Eberhard, 3,821,674.

Ward, Harold L., to Caterpillar Tractor Company. Pneumatic starter modulator valve means including lubricating means for pneumatically driven motors. 3,820,441, Cl. 91-46.000.

Ward, Harold L., to Caterpillar Tractor Company. Pneumatic starter modulation for pneumatically driven systems. 3,820,444, Cl. 91-459.000.

Ward, Neal: *See—*
Heyes, James; and Ward, Neal, 3,821,415.

Warner, Philip C., to GTE Sylvania Incorporated. Temporary storage apparatus. 3,821,724, Cl. 340-173.00r.

Warner-Lambert Company: *See—*
Sircar, Jagadish C.; Zinnes, Harold; and Shavel, John, Jr., 3,821,211.
Westall, Edward B.; Scanlan, James J.; and Sahaydak, Miroslaw (said Scanlan and said Sahaydak assors. to), 3,821,417.

Warren, Bernard J.: *See—*
Kimball, Stephen F.; Warren, Bernard J.; and Brooks, David N., 3,821,685.

Warren, Samuel C., to United States of America, Navy. Asynchronous band-pass pulse width filter. 3,821,[illegible], Cl. 307-234.000.

Warshal, Morris: *See—*
Harter, Lynn J.; and Warshal, Morris, 3,820,476.

Wartman, Lloyd H. Proportioning system. 3,820,557, Cl. 137-268.000.

Wasatonic, John J.: *See—*
Huyffer, Paul S.; and Wasatonic, John J., 3,821,254.

Watanabe, Hiromu: *See—*
Kitamura, Masaharu; Murakami, Kiyohiko; and Watanabe, Hiromu, 3,821,542.

Watanabe, Koichiro: *See—*
Urano, Fumio; Uno, Naoyuki; Nomura, Katsuhiko; Watanabe, Koichiro; Sakazaki, Tadazumi; and Miyata, Katsuhiko, 3,821,768.

Watanabe, Tetsuo: *See—*
Abe, Jinnosuke; Watanabe, Tetsuo; Yamaguchi, Tsutomu; Matsumoto, Kunio; and Fujii, Tadashiro, 3,821,081.

Water Control Products Inc.: *See—*
Larson, Wesley S., 3,820,171.

Water Control Products, Inc., mesne: *See—*
Caron, Roger P.; and Howard, Thomas P., 3,820,754.

Watkins, Charles L.: *See—*
Gibson, Ronald L.; and Watkins, Charles L., 3,820,706.

Watkins, Kenneth Ray, to United States Gypsum Company. Less dusty granular gypsum product and process. 3,820,970, Cl. 71-1.000.

Watkins, Robert A., to United States of America, Army, mesne. Missile guidance and control system. 3,820,742, Cl. 244-3.110.

Watsco, Inc.: *See—*
Wagner, William, 3,820,564.

Watson, James J.: *See—*
Longo, Isadore S.; and Watson, James J., 3,820,851.

Watt, Robert H. Lantern. 3,821,540, Cl. 240-6.40r.

Waugh, James Harry, Jr.; and Fenn, Darien S., to Texas Instruments Incorporated. Slice pre-aligner. 3,820,647, Cl. 198-244.000.

Wayne, Winston J.: *See—*
Kuszewski, James R.; Luckenbaugh, Raymond W.; and Wayne, Winston J., 3,821,223.

Wean United, Inc.: *See—*
Miller, John W., 3,820,775.

Wearn, Richard B., Jr.: *See—*
Baker, Donald James, Jr.; Hill, Ivan Winfield; and Wearn, Richard B., Jr., 3,820,391.

Webb, George L., to Deltrol Corp. Fast response soleinoid. 3,821,612, Cl. 317-151.000.

Webb, Jimmy L.: *See—*
Nelson, Gordon L.; and Webb, Jimmy L., 3,820,379.

Webb, Jimmy L.; and Hall, Walter L., to General Electric Company. Bisfluorenols. 3,821,317, Cl. 260-619.00b.

Webb, Robert F.; and Roberts, John J., to General Electric Company. Two-step magnetron start circuit. 3,821,594, Cl. 315-104.000.

Weber, Heinrich: *See—*
Streck, Roland; Nordsiek, Karl-Heinz; Weber, Heinrich; and Meyer, Klaus, 3,821,328.

Weber, Joanne B., to Eastman Kodak Company. Heat decolorizable antihalation layers of a vanadium complex of 8-hydroxyquinoline. 3,821,001, Cl. 96-84.00r.

Weber, Karl-Heinz, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Explosion-proof housing means for electrical circuitry used in mining machinery. 3,821,609, Cl. 317-99.000.

Weber, Lothar: *See—*
Ziener, Hermann; Weber, Lothar; Jahnke, Horst; Magenau, Horst; and Zimmermann, Georg, 3,821,028.

Wegman, Edwin H.: *See—*
Chiulli, Angelo J.; and Wegman, Edwin H., 3,821,364.

Wegner, Robert C.: *See—*
Carlson, Robert D.; Kraina, Jack H.; and Wegner, Robert C., 3,820,629.

Weib, Gunter: *See—*
Schruff, Horst; Lehmann, Helmut; Siefen, Jakob; Mathner, Hermann; Adams, Willi; and Weib, Gunter, 3,821,047.

Weichman, Bernard E., to Superior Oil Company, The. Shale oil and mineral recovery process. 3,821,353, Cl. 423-119.000.

Weil, Edward D., to Stauffer Chemical Company. 2,3-Dibromopropyl methyl acid phosphate. 3,821,336, Cl. 260-963.000.

Weinhardt, Erolf; and De Wit, Cornelis Leendert, to U.S. Philips Corporation. Heat transporting device. 3,820,596, Cl. 165-105.000.

Weinmann Aktiengesellschaft: *See—*
Schoch, Robert, 3,820,256.

Weisbach, Jerry A.: *See—*
Chow, Alfred W.; Dunn, George L.; Hoover, John R. E.; and Weisbach, Jerry A., 3,821,207.

Weiskopf, Marvin: *See—*
Dellian, Kurt A.; Weiskopf, Marvin; and Lee, Samuel, 3,820,952.

Weiss, Gerhart, to Baker Brush Co., Inc. Brush construction and method of making the same. 3,820,850, Cl. 300-21.000.

Weiste, Heinrich. Material dosaging apparatus. 3,820,688, Cl. 222-193.000.

Weller, Elmar, to Uwe-Unterwasser-Electric GmbH & Co. KG. Circulator for circulating water in receptacles. 3,820,173, Cl. 4-172.170.

Wells, John B.; and Sheckler, Addison C., to Xerox Corporation. Photoelectrophoretic imaging with fixing on a separate electrode. 3,820,987, Cl. 96-1.300.

Wells, Wayne W.; Christie, James R.; and Jackson, Julian H., to Kerr-McGee Chemical Corporation, mesne. Slow release soil fumigants. 3,820,976, Cl. 71-101.000.
Welstead, William J., Jr., to Robins, A. H., Company, Inc. Treatment of Parkinsonism with 3-(omega-substituted alkyl)-indoles. 3,821,387, Cl. 424-267.000.
Wembley Industries, Inc.: *See*—
Gouner, Aubrey L., 3,820,166.
Wentorf, Robert H., Jr.: *See*—
Interrante, Leonard V.; and Wentorf, Robert H., Jr., 3,821,358.
Wesner, Charles R., to Sperry Rand Corporation. Variable intensity illuminator. 3,821,600, Cl. 315-291.000.
West, William A. Tool for removing bushing adaptors. 3,820,220, Cl. 29-252.000.
Westall, Edward B.; Scanlan, James J.; and Sahaydak, Miroslaw, said Scanlan and said Sahaydak assors. to Warner-Lambert Company. Flavor preservation in chewing gum compositions and candy products. 3,821,417, Cl. 426-3.000.
Westendorp, Frans Frederik; Luiten, Willem; and De Kort, Gijsbertus Maria Arnolds Josephus, to U.S. Philips Corporation. High-density high-energy anisotropically permanent magnet. 3,821,034, Cl. 148-31.570.
Westermann, Peter Henry; and Fogg, Sidney George, to BP Chemicals International Limited. Polymer composition. 3,821,158, Cl. 260-41.50r.
Western Electric Company Incorporated: *See*—
De Angelo, Michael Anthony, 3,821,016.
Western Rock Bit Company Limited: *See*—
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1 3,820,970
35 3,820,971
37 3,820,972
77 3,820,973
94 3,820,974
98 3,820,975
101 3,820,976

CLASS 72
8 3,820,365
9 3,820,366
17 3,820,367
47 3,820,368
55 3,820,369
75 3,820,370
98 3,820,371
185 3,820,373
203 3,820,372
265 3,820,374
318 3,820,375
427 3,820,376
461 3,820,377
465 3,820,378

CLASS 73
15R 3,820,379
19 3,820,380
40 3,820,381
40.7 3,820,382
41 3,820,383
67.9 3,820,387
84 3,820,384
3,820,385
116 3,820,386
141A 3,820,388
151 3,820,389
152 3,820,390
170A 3,820,391
194E 3,820,392
204 3,820,393
223 3,820,394
231R 3,820,395
308 3,820,396
328 3,820,397
336.5 3,820,398
368 3,820,399
398AR 3,820,401
3,820,402
398R 3,820,400
480 3,820,403

CLASS 74
2 3,820,404
3.5 3,820,405
6 3,820,406
112 3,820,407
200 3,820,408
233 3,820,409
393 3,820,410
394 3,820,411
422 3,820,412
425 3,820,413
462 3,820,414
498 3,820,415
690 3,820,416
733 3,820,417
759 3,820,418

CLASS 75
.5AA 3,820,977
95 3,820,978
108 3,820,979
122 3,820,980
126C 3,820,981
129 3,820,982
170 3,820,983

CLASS 76
112 3,820,419

CLASS 81
9.5R 3,820,420

CLASS 82
20 3,820,421
36R 3,820,422
47 3,820,423
101 3,820,424

CLASS 83
7 3,820,425
13 3,820,426
18 3,820,427
38 3,820,428
76 3,820,429
100 3,820,430
251 3,820,431

CLASS 84
1.01 3,821,457
1.13 3,821,458
3,821,459
1.17 3,821,460
1.19 3,821,461
94 3,820,432
436 3,820,433
485 3,820,434

CLASS 89
1R 3,820,435
36K 3,820,436

CLASS 90
12 3,820,437

CLASS 91
36 3,820,438
37 3,820,439
40 3,820,440
46 3,820,441
259 3,820,442
420 3,820,443
459 3,820,444
481 3,820,445

CLASS 92
88 3,820,446

CLASS 93
73 3,820,447

CLASS 96
1LY 3,820,986
1PS 3,820,984
1R 3,820,985
1.3 3,820,987
1.5 3,820,988
3,820,989
3 3,820,990
22 3,820,991
27E 3,820,992
35.1 3,820,993
36 3,820,994
48R 3,820,995
49 3,820,996
56 3,820,997
64 3,820,998
76R 3,821,000
76 3,820,999
84R 3,821,001
94R 3,821,002

CLASS 98
42 3,820,448

CLASS 99
485 3,820,449
643 3,820,450

CLASS 100
4 3,820,451
37 3,820,452
188R 3,820,453
269R 3,820,454

CLASS 101
93MN 3,820,456
93C 3,820,455
244 3,820,457
269 3,820,458
365 3,820,459
382MV 3,820,460

CLASS 102
22 3,820,461
35.6 3,820,462
38 3,820,463
67 3,820,464
92 3,820,465

CLASS 104
IR 3,820,466
23FS 3,820,467
3,820,468
96 3,820,469
148LM 3,820,472
148MS 3,820,470
148SS 3,820,471

CLASS 105
250 3,820,473
366B 3,820,474
376 3,820,475
404 3,820,476

CLASS 106
1 3,821,003
52 3,821,004
55 3,821,005
85 3,821,006
150 3,821,007
209 3,821,008

CLASS 108
89 3,820,477
136 3,820,478

CLASS 109
1 3,820,479

CLASS 111
2 3,820,480

CLASS 112
68 3,820,481
79A 3,820,482
121.2 3,820,483
121.26 3,820,484
158A 3,820,485

CLASS 113
120M 3,820,486

CLASS 114
.5R 3,820,488
39 3,820,489
66.5H 3,820,490
74A 3,820,491
3,820,492
102 3,820,493
200 3,820,494
219 3,820,495

CLASS 115
IR 3,820,497

CLASS 116
114R 3,820,498
114.5 3,820,499
115.5 3,820,501
174 3,820,500

CLASS 117
33.5CM 3,821,009
36.2 3,821,010
37LE 3,821,011
45 3,821,012
46CC 3,821,013
46FC 3,821,014
47A 3,821,015
3,821,016
76T 3,821,017
94 3,821,018
105.2 3,821,019
106A 3,821,020
135.5 3,821,021
137 3,821,022
139.5A 3,821,023
217 3,821,024
235 3,821,025

CLASS 118
6 3,820,502
24 3,820,503
65 3,820,504
118 3,820,505

CLASS 119

14.01 3,820,506
35 3,820,507
73 3,820,508

CLASS 122

6R 3,820,509
7R 3,820,510

CLASS 123

8.13 3,820,512
8.17 3,820,513
8.41 3,820,515
8.47 3,820,516
32EA 3,820,198
3,820,517
119A 3,820,514
119B 3,820,518
140MP 3,820,519
148E 3,820,520
3,820,521
188S 3,820,522
191A 3,820,523

CLASS 126

20 3,820,524
21A 3,820,525
110R 3,820,526
137 3,820,527

CLASS 128

1R 3,820,528
2S 3,820,529
2.05F 3,820,530
2.06E 3,820,531
66 3,820,532
79 3,820,533
82.1 3,820,534
130 3,820,535
132 3,820,536
142.2 3,820,537
3,820,538
145.8 3,820,539
212 3,820,540
215 3,820,541
218DA 3,820,542
305 3,820,543
326 3,820,544
330 3,820,545
349 3,820,546

CLASS 130

5B 3,820,547

CLASS 131

2 3,820,548
121 3,820,549

CLASS 132

7 3,820,550
11 3,820,551

CLASS 134

2 3,821,026
21 3,821,027
113 3,820,552

CLASS 135

4R 3,820,553

CLASS 136

86D 3,821,028
134R 3,821,029
232 3,821,030

CLASS 137

67 3,820,554
100 3,820,555
209 3,820,562
220 3,820,556
268 3,820,557
269 3,820,558
355.16 3,820,559
493.4 3,820,560
512.2 3,820,561
561R 3,820,563
612.1 3,820,564
614.2 3,820,565
624.14 3,820,566
625.66 3,820,567
625.68 3,820,568
816 3,820,569

CLASS 138

39 3,820,570
44 3,820,571
106 3,820,572
141 3,820,573

CLASS 139

127P 3,820,574

CLASS 141

18 3,820,575
24 3,820,576
67 3,820,577
190 3,820,578

CLASS 148

2 3,821,031
6.35 3,821,032
31.57 3,821,034
3,821,035
126 3,821,036
145 3,821,037
171 3,821,039
175 3,821,033
186 3,821,038
189 3,821,040

CLASS 149

18 3,821,041
19.4 3,821,042
36 3,821,043

CLASS 151

41.73 3,820,579

CLASS 156

3 3,821,045
69 3,821,046
3,821,047
73 3,821,048
3,821,049
143 3,821,050
190 3,820,583
203 3,821,051
250 3,821,052
257 3,821,053
308 3,821,054
309 3,821,055
331 3,821,056
384 3,821,057
468 3,821,058

CLASS 157

13 3,820,580

CLASS 159

13A 3,820,581
18 3,820,582

CLASS 161

36 3,821,059
39 3,821,060
42 3,821,061
59 3,821,062
60 3,821,063
62 3,821,064
67 3,821,065
3,821,066
3,821,067
172 3,821,070
183 3,821,071
214 3,821,072

CLASS 162

111 3,821,068
126 3,821,073
146 3,821,074
158 3,821,069
179 3,821,075
301 3,821,076
351 3,821,077

CLASS 164

1C 3,820,634
71.9 3,820,635
77R 3,820,636
106P 3,820,637
206A 3,820,638

CLASS 191

12.2R 3,821,496
57 3,821,497

CLASS 192

.098 3,820,641
3T 3,820,639
45 3,820,640

CLASS 194

1N 3,820,642

CLASS 195

5 3,821,080
29 3,821,081
31F 3,821,082
63 3,821,083
68 3,821,084
80R 3,821,085
116 3,821,086
127 3,821,087

CLASS 197

1A 3,820,644
1R 3,820,643
6.7 3,820,645
114R 3,820,646

CLASS 198

34 3,820,648
35 3,820,649
204 3,820,650
244 3,820,647

CLASS 200

18 3,821,498
38BA 3,821,502
38R 3,821,503
52R 3,821,504
61.13 3,821,499
86R 3,821,500
144B 3,821,505
148BV 3,821,506
148R 3,821,507
153J 3,821,528
155R 3,821,501
159R 3,821,529
249 3,821,530
302 3,821,531
330 3,821,532
338 3,821,533
69.5TV 3,821,470

CLASS 179

1GQ 3,821,471
3,821,474
1SA 3,821,472
1F 3,821,473
1M 3,821,475
6R 3,821,476
15AF 3,821,478
15BF 3,821,479
15A 3,821,477
3,821,480
15R 3,821,481
15.55R 3,821,482
16F 3,821,483
18DA 3,821,485
18EB 3,821,484
18FA 3,821,486
90AD 3,821,487
100.11 3,821,489
100.4C 3,821,488
111E 3,821,491
3,821,492
111R 3,821,490
170.2 3,821,493
170.6 3,821,494
175 3,821,495

CLASS 180

1E 3,820,614
1F 3,820,615
9.48 3,820,616
19R 3,820,617
70R 3,820,618
79.2R 3,820,619
3,820,620
90 3,820,621
98 3,820,622
3,820,623
105E 3,820,624

CLASS 181

33HB 3,820,630
33HC 3,820,626
3,820,628
33G 3,820,627
3,820,629

CLASS 182

141 3,820,631

CLASS 187

3 3,820,632
29R 3,820,625
95 3,820,633

CLASS 188

1C 3,820,634
71.9 3,820,635
77R 3,820,636
106P 3,820,637
206A 3,820,638

CLASS 191

12.2R 3,821,496
57 3,821,497

CLASS 192

.098 3,820,641
3T 3,820,639
45 3,820,640

CLASS 194

1N 3,820,642

CLASS 195

5 3,821,080
29 3,821,081
31F 3,821,082
63 3,821,083
68 3,821,084
80R 3,821,085
116 3,821,086
127 3,821,087

CLASS 197

1A 3,820,644
1R 3,820,643
6.7 3,820,645
114R 3,820,646

CLASS 198

34 3,820,648
35 3,820,649
204 3,820,650
244 3,820,647

CLASS 200

18 3,821,498
38BA 3,821,502
38R 3,821,503
52R 3,821,504
61.13 3,821,499
86R 3,821,500
144B 3,821,505
148BV 3,821,506
148R 3,821,507
153J 3,821,528
155R 3,821,501
159R 3,821,529
249 3,821,530
302 3,821,531
330 3,821,532
338 3,821,533
3,821,534

CLASS 202

269 3,821,088

CLASS 203

10 3,821,089

CLASS 204

1T 3,821,090
1.5 3,821,091
15 3,821,092
38A 3,821,093
54R 3,821,094
55R 3,821,095
105M 3,821,096
106 3,821,097
159.22 3,821,098
181 3,821,099
195G 3,821,100
243R 3,821,101
299 3,821,102

CLASS 206

1.5 3,820,654
42 3,820,655
72 3,820,656
166 3,820,657
365 3,820,652
390 3,820,651
508 3,820,685
520 3,820,684
525 3,820,653

CLASS 208

72 3,821,103
93 3,821,104
139 3,821,105

CLASS 210

1 3,821,106
12 3,821,107
23 3,821,108
36 3,821,109
63 3,821,110
104 3,820,658
195 3,820,659
198C 3,820,660
321 3,820,661

CLASS 211

5 3,820,662

CLASS 212

99 3,820,663

CLASS 214

1BT 3,820,667
1BV 3,820,666
1D 3,820,665
1.5 3,820,668
8.5SS 3,820,669
14 3,820,664
16.1DB 3,820,670
16.4C 3,820,671
17DA 3,820,672
77R 3,820,673
313 3,820,496
730 3,820,674

CLASS 215

9 3,820,675
3,820,676
12R 3,820,677
253 3,820,678

CLASS 219

10.49 3,821,508
10.77 3,821,509
121L 3,821,510
155 3,821,511
213 3,821,512
233 3,821,513
296 3,821,514
497 3,821,515
3,821,516
546 3,821,517

CLASS 220

22.3 3,820,679
39R 3,820,680
54 3,820,681
55K 3,820,682
60A 3,820,683

CLASS 221

305 3,820,686

CLASS 222

53 3,820,687
193 3,820,688
196 3,820,697
205 3,820,698
207 3,820,689
475 3,820,511
490 3,820,690
547 3,820,692
559 3,820,693
560 3,820,691

CLASS 223

66 3,820,694

CLASS 224

45AA 3,820,695
45P 3,820,696

CLASS 226

43 3,820,699
74 3,820,700
183 3,820,701

CLASS 227

9 3,820,702
10 3,820,703
110 3,820,704
113 3,820,705

CLASS 229

34R 3,820,706
39B 3,820,707
40 3,820,708
3,820,709
52B 3,820,710

CLASS 235

61.11D 3,821,519
61.11E 3,821,520
61.11 3,821,518
119 3,821,521
137 3,821,522
150.27 3,821,523
151 3,821,524
151.1 3,820,711
3,821,525
151.32 3,820,712
152 3,821,527
156 3,821,535
160 3,821,536
201PF 3,821,537

CLASS 236

1E 3,820,713

CLASS 239

10 3,820,714
17 3,820,715
102 3,820,716
107 3,820,717
135 3,820,718
265.31 3,820,719
265.39 3,820,720
288.5 3,820,721
373 3,820,722
533 3,820,723

CLASS 240

2AD 3,821,538
6.4R 3,821,540
6.45R 3,821,539
22 3,821,541
145 3,821,542

CLASS 241

39 3,820,724
76 3,820,725
102 3,820,726
183 3,820,727

CLASS 242

1.1R 3,820,728
7.21 3,820,729
35.5R 3,820,730
42 3,821,543
46.4 3,820,739
47.12 3,820,731
55 3,820,732
94 3,820,733
95 3,820,734
110 3,820,735
110.2 3,820,736
129.5 3,820,737
197 3,820,738

CLASS 243

19 3,820,740

CLASS 244

1SD 3,820,741
3.11 3,820,742
4R 3,820,743
5 3,820,744
40R 3,820,745
55 3,820,746
118R 3,820,747
149 3,820,748

CLASS 246

34CT 3,821,544

CLASS 248

44 3,820,749
154 3,820,750
181 3,820,751
278 3,820,752

CLASS 249

164 3,820,753

CLASS 250

201 3,821,545
207 3,821,546
211J 3,821,549
214P 3,821,547
216 3,821,548
226 3,821,550
233 3,821,551
339 3,821,553
388 3,821,552
396 3,821,554
497 3,821,555
505 3,821,556
572 3,821,557
577 3,821,558

CLASS 251

38 3,820,754
85 3,820,755
121 3,820,756
139 3,820,757

CLASS 252

12 3,821,111
12.4 3,821,112
62.1 3,821,113
78 3,821,114
89 3,821,115
90 3,821,116
99 3,821,117
3,821,118
135 3,821,119
186 3,821,120
351 3,821,121
353 3,821,122
439 3,821,123
531 3,821,124

CLASS 256

10 3,820,758

CLASS 259

8 3,820,760
24 3,820,759
109 3,820,761
154 3,820,762
178R 3,820,763

CLASS 260

2EN 3,821,125
2.1E 3,821,127
2.1R 3,821,126
2.5AC 3,821,131
2.5AM 3,821,132
2.5BD 3,821,130
2.5B 3,821,128
2.5E 3,821,129
3 3,821,133
5 3,821,134
9 3,821,135
3,821,136
17.4GC 3,821,137
18S 3,821,140
23H 3,821,139
3,821,141
3,821,142
23R 3,821,138
28.5AS 3,821,144
28.5B 3,821,143
29.4UA 3,821,145
29.6MM 3,821,146
29.6N 3,821,147
30.6R 3,821,148
3,821,149
31.6 3,821,150
31.8R 3,821,151
33.6AQ 3,821,152
33.6SB 3,821,154
33.6UA 3,821,153
37EP 3,821,155
40R 3,821,156
42.18 3,821,158
42.47 3,821,157
45.7R 3,821,159
45.7S 3,821,160
45.75R 3,821,163
45.8N 3,821,161
3,821,162
47CB 3,821,165
47CZ 3,821,164
47EN 3,821,166
49 3,821,167
3,821,168
77 3,821,169
78SC 3,821,171
78R 3,821,170
78.5R 3,821,172
79.3M 3,821,173
80.71 3,821,174
80.73 3,821,175
85.5R 3,821,176
3,821,177
3,821,178
88.1R 3,821,179
89.1 3,821,180
91.5 3,821,181
91.7 3,821,182
93.1 3,821,183
93.7 3,821,184
94.7HA 3,821,187
94.7R 3,821,185
94.9E 3,821,186
112.5 3,821,188
3,821,189
143 3,821,190
152 3,821,191
206 3,821,195
207 3,821,194
209R 3,821,192
3,821,193
212 3,821,196
239D 3,821,197
239.1 3,821,198

239.3A 3,821,202
239.3D 3,821,203
239.3P 3,821,199
239.3T 3,821,201
239.7 3,821,200
240D 3,821,205
240F 3,821,204
243AN 3,821,213
243C 3,821,206
3,821,206
3,821,207
3,821,208
3,821,209
243R 3,821,210
3,821,211
3,821,212
244R 3,821,214
3,821,215
247.1 3,821,216
247.2A 3,821,217
248NS 3,821,218
3,821,219
249.6 3,821,220
251R 3,821,221
256.5R 3,821,222
260 3,821,223
3,821,224
268H 3,821,225
285.5 3,821,226
286R 3,821,227
288R 3,821,228
293.56 3,821,230
293.79 3,821,231
294.8A 3,821,233
294.8K 3,821,232
294.8R 3,821,229
295AM 3,821,234
295.5R 3,821,235
302SD 3,821,236
302R 3,821,237
306.8R 3,821,238
3,821,239
307D 3,821,240
309 3,821,241
309.5 3,821,242
3,821,243
309.6 3,821,244
326E 3,821,246
326.47 3,821,248
326.5FN 3,821,245
326.5S 3,821,247
327B 3,821,249
329R 3,821,250
335 3,821,251
3,821,252
340.9 3,821,253
343.2R 3,821,254
343.3 3,821,255
346.2R 3,821,256
346.4 3,821,257
347.4 3,821,260
347.7 3,821,261
348.5V 3,821,259
380 3,821,262
403 3,821,263
408 3,821,264
413 3,821,265
453R 3,821,266
455R 3,821,267
3,821,268
3,821,269
456A 3,821,270
456R 3,821,271
457 3,821,272
463 3,821,273
464 3,821,274
3,821,275
465D 3,821,277
465E 3,821,276
465.9 3,821,278
468D 3,821,279
3,821,280
470 3,821,281
471R 3,821,282
473R 3,821,283
3,821,284
476R 3,821,285
485R 3,821,258
486D 3,821,287
486R 3,821,286
488B 3,821,288
501.16 3,821,289
513R 3,821,290
514D 3,821,291
515A 3,821,293
515R 3,821,292
520 3,821,294
534S 3,821,295
535P 3,821,296
543F 3,821,297
561N 3,821,299
3,821,300
561R 3,821,298
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